FLIGHT

The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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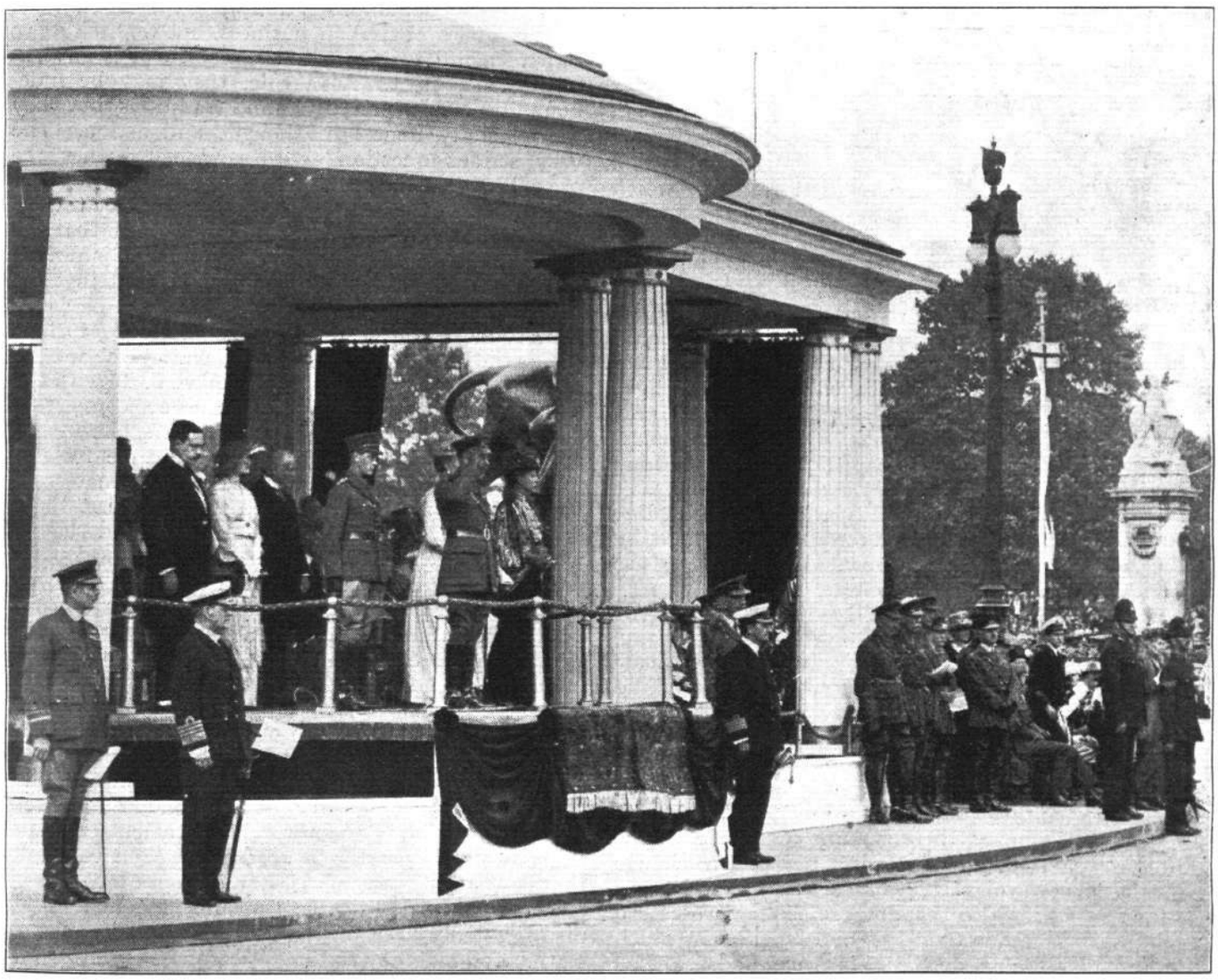

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PEACE DAY, SATURDAY, JULY 19, 1919

His Majesty King George taking the salute in front of Buckingham Palace. On the dais are Queen Mary, Queen Alexandra, the Prince of Wales, Ex-King Manoel and Mr. Lloyd George. Gen. Trenchard (on extreme left) and a group of generals and staff officers are in front of the Royal box.

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The Aircraft Engineer and Airships

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CONTENTS

EDITORIAL COMMENT

IN our last week's issue there appeared an advertisement of the London and Provincial Aviation Company which is of the most serious portent. We refrained from comment then because we thought it best to wait until the exceedingly grave announcement made by the advertisement in question could be given full consideration, and we could approach the subject without the heat that must necessarily be engendered by the light it sheds on the methods of the Air Ministry. We refer to the announcement that the company, after a long and creditable association with the development of aviation, has, according to its own allegation, been forced out of business by the methods of "encouragement" extended by the Civil Aviation Department of the Air Ministry.

The "Encouragement" of Civil Aviation

We have examined the alleged facts of the Air Ministry's action toward the enterprise of the company, and we must say that there is a *prima facie* case made out. Briefly, the Ministry refused, so it is said, to license as airworthy certain machines built by the company because they were fitted with the 50-h.p. Gnome engine, and it also declined to license aerodromes selected by the company in connection with a scheme for pleasure flights at certain well-known resorts. Obviously, the company could not, in the time available before the end of the season, change the design of the machines or secure other aerodromes, and has thus decided that the game is not worth the candle, and intends to go out of a business in which its directors see no chance of making good.

These are the bald facts as they are stated to us. There may be another side to the story, but if there is the Air Ministry has not thought it worth while to give it. Therefore, we accept the view of the case as presented by the company, at least until the Air Ministry deigns to give its explanation of the circumstances which have led to the closing down of an important enterprise at a time when we ought to be straining every nerve to foster the cause of civil aviation. It is not so much the alleged reasons for the attitude of the Ministry which cause us concern as the attitude itself. What is the meaning of it? We have a special department of the Ministry which ostensibly exists for the purpose of encouraging such enterprises as the London and Provincial Aviation Company desired to carry out. It would seem that even if the company's scheme was weak in details, which does not appear from the evidence before us, it was the business of that department to point out where it was lacking, and even to give advice as to how to remedy those weaknesses and to assist in bringing the scheme within the limits of Air Ministry requirements. Nothing of the sort appears to have been done. On the contrary, the usual official attitude appears to have been taken up, and the result is that an important firm has withdrawn from the lists and will have no more of it.

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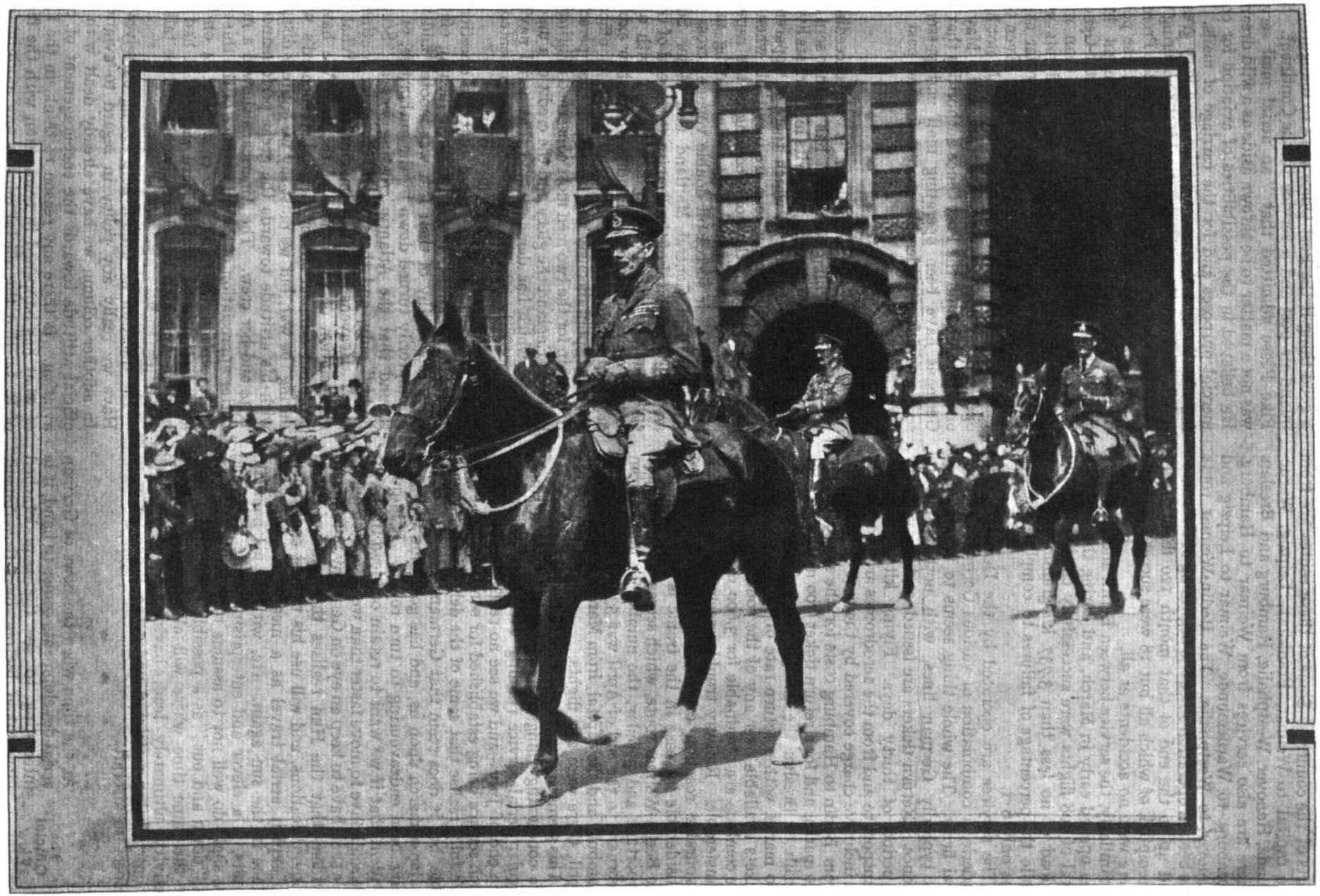
What is Wrong?

We are at all times more than a little critical of official crassitude. We have a very poor opinion of official methods of administration when they are applied to the affairs of civilian business, but we hesitate to impute moral turpitude to the officials of a Government department. As a rule, they may be hidebound by official precedents and traditions, but they are generally honest in thought and action. The very serious question arises now of whether the prevailing doctrine of "every man for himself" does not enter into the attitude of the Air Ministry toward civilian flying enterprise. We do not allege that the official attitude and policy of the Ministry is not all that could be desired, nor would we suggest that the heads of departments are otherwise than perfectly honest and enthusiastic in their desire to further civil aviation as one great movement. But we are not so convinced that others who have to do with the administration of that policy are so completely disinterested as to be above putting a spoke in the wheel of enterprise in order to gain time for the furtherance of their own schemes. As a matter of fact, we are very much inclined to think that there is more than a little in this suspicion, and that it would be well if those at the head of certain departments of the Air Ministry would personally go out of their way to enquire closely how far certain members of their staffs are interested in civil developments which require time to bring to fruition and which might be prejudiced by too rapid a march of events before these schemes have come to a head. Of course, we may be quite wrong in our theory of cause and effect, nor do we specifically allege that it has had anything to do with the sequence of events which has led up to the closing down of the London and Provincial Aviation Company. Nevertheless, certain things we have heard and observed lead us to think that it would be just as well to make sure that every official connected with the Air Ministry is really and disinterestedly keen on the most rapid development of the civil side of aviation.

Germany Going Ahead

Although the internal state of Germany is not all it might be, there would seem to be little doubt that she is intent upon the development of aerial services for the conveyance of passengers and goods. According to official information received here, it appears that



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Major-General Sir JOHN MAITLAND SALMOND, K.C.B., C.M.G., C.V.O., D.S.O., at the head of the R.A.F., in the Peace Procession, July 19, 1919

there are already passenger services in operation radiating from Berlin to various more or less remote parts of the country. Some of these routes are from the capital to Weimar, Frankfort, Leipzig, Warnemunde, Hanover, Westphalia, Hamburg and Breslau. There are also services from Weimar to Hamburg, Hamburg to Warnemunde, Weimar to Leipzig and Hanover to Westphalia. The Berlin-Weimar route has been in operation since the beginning of February, and up to the end of that month 120 flights were attempted, of which all but 18 were successful, while there were no accidents at all.

Similarly, the service between Berlin and Hamburg was opened early in March, and during the month a total of 108 flights were successfully carried out and a load of no less than 3,737 kilogrammes carried, while the percentage of failures to complete the trip was only 6·1.

The services are operated by the Deutsche Luft Rederie, a combination of various German aeronautical firms. The whole thing seems to be organised on typically German lines, with nothing left to chance. Return tickets are issued, and are valid for a period of thirty days. Flying kit and motor transport to and from the aerodromes are provided at an inclusive charge covered by the cost of the ticket. From Berlin to Hamburg costs for the single journey 450 marks, and for a return ticket 700 marks. From Berlin to Breslau the charge for a single ticket is 500 marks, with a return rate of 750 marks. Serial tickets available over any of the routes operated by the combine are obtainable for 3,600 marks, and are transferable. Railway troubles seem to have had a favourable reaction on the aerial services, and a considerable increase in the traffic is reported. On the Berlin-Weimar route, which seems to be the most important and popular, the number of flights from February to the end of April was 538, while between Hamburg and the capital, from March 1 to the end of April, there were 262 flights.

This seems in marked contrast to the laggard way we are conducting things here. We have not a single regular aerial service running even now—nearly at the end of July—and we see no real prospect of any such service being established for some time to come. We fully realise that some of the delay was unavoidable, but it does seem that Germany has once more stolen a march upon us, and has got going while we have been endeavouring to turn round. It is quite evident that if we want to retain our lead in the air we shall have to move faster than we have been doing. We shall have to keep an eye on Germany. It is very evident that the Hun realises the value of aerial communications, and will use his utmost endeavours to exploit aerial travel as a means to getting his place in the sun again. He, with all his manifold faults, is a clever and enterprising competitor, and we shall do well not to assume too readily that he is "down and out" as a possible competitor. But at the same time where will all this German air activity ultimately lead, having regard to that country being restricted under the Peace terms in respect to aircraft.

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The Official View

At the time when the news of German aerial developments comes to hand, it is interesting to see the semi-detached view taken by our own Government officials of the possibilities of aerial communication. During the recent debate on the Post Office Vote, Captain Wedgwood Benn suggested that it would be a good thing if the Post Office were to inaugurate an inland air post and a service to the Continent. Mr. Pike Pease admitted that "an aerial mail service was not a matter to be thrown aside as a wild dream." He believed in the possibilities of aviation for commercial purposes and for the carriage of mails. In fact, he thought these possibilities were very great.

Why not put them to a practical test? During the peace *pourparlers*, Cabinet Ministers, from the Premier down, had ample opportunity of testing these possibilities, and surely their experiences might have convinced even the Assistant Postmaster-General that aerial carriage of mails has more than mere possibilities. A very large number of flights were made between London and Paris with, so far as we remember, only a single serious accident. Even that was a matter of sheer bad luck, which would not have operated on one occasion in a thousand. May we once more remind the Post Office authorities that the Germans have been operating mail and passenger services with considerable success for the past five months?

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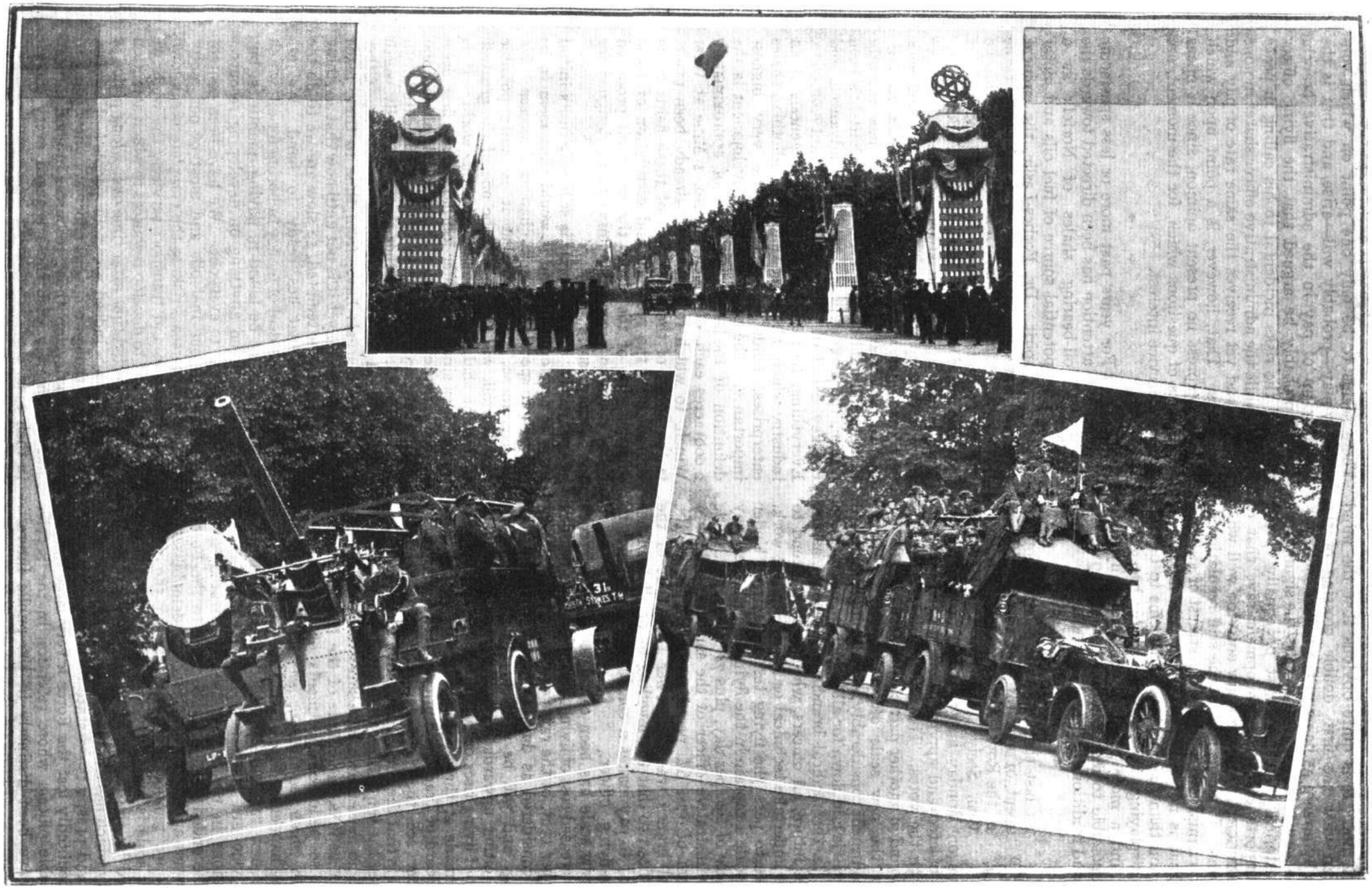
R 34—and After

British officialism is an exceedingly peculiar thing. It has neither soul nor imagination, while its high priests live in a rut out of which there is apparently no escape. These reflections are inevitable when we regard the story of the home-coming of the captain and crew of the airship R 34, after having made history by their successful double voyage across the Atlantic. Did General Maitland and Major Scott arrive in the capital of the Empire at the end of their epoch-making enterprise to be received with open arms and with the official plaudits which their exploit deserved? Not at all. A small group of officers, gathered spontaneously and because of their personal friendship for the two men most concerned in bringing home to England the glory and the credit of a unique exploit, which has demonstrated that aerial navigation is not only possible but practical, represented all the welcome vouchsafed them. Why?

We are given to understand that the question of giving these gallant officers and their men an official reception worthy of their feat was mooted and was peremptorily turned down by the authorities, on the ground that the Atlantic crossing was a "Service flight" only, and therefore in the strict routine of duty. Heavens! What imagination! What an appreciation of the fitness of things! We have a profound admiration for General Trenchard's work during the war, but we must say we entirely disagree with his attitude towards the great performance of R 34 and her crew. The Americans showed a much better appreciation of the importance of the thing by the reception they gave the crew of R 34 on her arrival at Mineola, and we dare wager that had she been an American vessel they would still be talking about it.

The question we cannot help asking ourselves is: Have we really any policy in regard to aviation? In another column we have already dealt with the official attitude towards the encouragement of civil aviation. Is there any reason to think, in the light of what has happened in connection with the flight of R. 34, that the official mind is any more imaginative in regard to purely Service developments?



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THE GREAT VICTORY MARCH THROUGH LONDON, JULY 19, 1919: Above, The Mall, with Buckingham Palace in the distance, and a "sausage" balloon up above; left, a unit in the Anti-Aircraft section, and right, the W.R.A.F.s in their "automobiles."

We think not. It is quite obvious that the mind which can view the first double crossing of the Atlantic by airship as being in the nature merely of a routine service flight, and can miss the significance of its historical incidence, must be equally obtuse to the importance of all development save that of "THE SERVICE." And we know only too well what that means. It means simply the stiff regulation of a stiff mechanism swaddled in the stiffest of stiff red tape. That is not what we want. We need more imagination than the Service mind seems to be capable of displaying. We want a greater breadth of outlook and a more generous view generally than appears possible to men who are brought up in the routine and traditions of "THE SERVICE."

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The Pay of the R.A.F.

At last the long-anticipated announcement of new rates of pay for officers of the Royal Air Force has been made. Gen. Seely stated in the House of Commons on Monday last that the new scale had been completed and approved and was being circulated with the votes. The full details of the scale will be found in another part of this issue of FLIGHT.

Under the new scale officers of the non-flying branches benefit considerably, since a single standard rate of pay is laid down for all branches,, except such services as the medical branch and school-masters, while, in future, all officers, whether they intend to fly or to undertake technical or administrative work, will have to pass the flying test on entry. Under the old scale a captain in the flying branch drew pay at the rate of 19*s.* per day, plus 7*s.* flying pay, while the administrative officer of the same rank drew a maximum of 17*s.* 6*d.* per diem. The pay of the technical branch was also lower than that of the flying officer, so that the levelling up of all branches in regard to pay makes a considerable difference to the non-flying officer.

The new scale has been calculated with reference to the increased cost of living, and it has been decided that 20 per cent. of the rates of pay and retired pay will be considered as due to the present high cost of living, and will be subject after five years to change, either upwards or downwards according as the cost of living rises or falls. Subsequent revisions will be made at three-yearly intervals on the basis of the Board of Trade food prices. We really do not altogether see the need for this announcement, unless it is that the Air Ministry and the Government are under the impression that service in the R.A.F. is worth no more than a bare subsistence rate of pay. However, as it is, the officers of the R.A.F. can look forward to periodic adjustments of their rates of pay from which they may or may not benefit as the case may happen to be.

These new rates are intended to apply only to officers who are given permanent or short-service commissions in the R.A.F. as reconstituted, or to officers seconded from other Services to the Forces. They do not apply to officers awaiting demobilisation or who are temporarily retained. On the whole, the new scale is eminently satisfactory, and will be welcomed by the R.A.F. as setting at rest the uncertainty which has existed for so long as to the future of pay and prospects—a state of uncertainty which has undoubtedly lost the Force a very large number of valuable officers whose retention in the Service would have been distinctly in the public interest. There seems to be only one point on which controversy may—probably will—arise, and that is the levelling up of pay in the administrative branch. It will probably be argued that the flying officer takes all the risks incidental to his calling in peace or war, while the administrative officer shares in none of these and yet receives the same rate of pay and allowances. That, however, is a point upon which we need express no present opinion, since it opens up all sorts of questions which, for the moment, are of purely Service interest.

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Oil in the Eastern Counties

For years past more or less spasmodic attention has been directed towards the oil-bearing shales of Norfolk as a potential source of fuel oils and motor spirit. Dr. Forbes-Leslie, the eminent geologist, has been persistent in declaring that the richest shales in Britain, if not in the world, lie within the rectangle defined by King's Lynn, Great Massingham, Downham Market, and Cockley Cley. Until quite recently no steps had been taken to actively develop the resources of this area, but work is proceeding now on a fairly ambitious scale. According to a *Times* correspondent who has recently traversed the oil-bearing area, a first shaft has been driven, the driving of the roads well advanced, and the key detail of the distillation plant complete. Everything, he says, is ready for the genesis of an industry which, richer far than the Midlothian shales enterprises, holds prospects of the very highest importance. The programme of development is the definition of the area into fields of approximately 2,000 acres each, of which the No. 1 Mine at West Winch, to which reference has already been made, is the outlet of the first, each of these fields being equipped for the recovery and distillation of 1,000 tons per day of the shale, the crude oil produced being taken to a central refining plant designed for the Setchey centre.

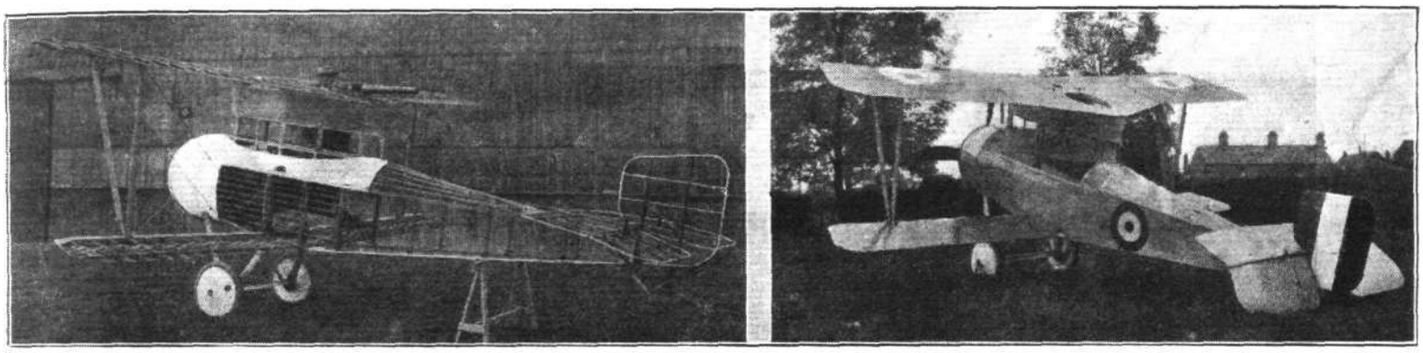
Apparently, the enterprise is still only in its initial stage of development, and it would thus seem to be too early to speculate upon its chances of success. We are convinced, however, that it is quite possible that Norfolk will turn out to be one of the greatest centres of shale oil production in the world. It is many years since our sister journal, AUTO., first drew attention to the possibilities of the Norfolk shales, and urged that they should at least be experimented with in order to ascertain whether they were really worth developing as an oil-producing enterprise. Other responsible journals have, from time to time, made similar references, yet it is not until now that anything serious is being attempted, so slow are we to do the obvious thing that lies ready to hand. We are spending a great deal of money in boring for oil, which may or may not be found in paying quantities, but we will not spend anything on developing resources that are patent to everyone. We have been content to import all our fuel oils and most of our motor spirit from overseas, risking the complete breakdown of our aviation and transport services, the while we made no effort to develop resources to which attention has been directed time after time over a long period of years. We are indeed a curious people! However, it seems as though a serious effort were now going to be made to develop those resources in good earnest, and we sincerely wish those engaged every success in their task.

FLIGHT

"MILESTONES" *

THE SAGE MACHINES

THE entry of Messrs. Fredk. Sage and Co., Ltd., into the world of aircraft manufacture dates back to 1915, in which year a contract for building Short seaplanes of the 184 type was received. The manager of the aviation department was Mr. E. C. Gordon England, who is well known both as a designer and pilot, having at various times during his long career been associated with, among others, the British and Colonial Aeroplane Co., of Bristol, with Mr. James Radley, of Huntingdon, and with J. Samuel White and Co., Ltd., of Cowes. Isle of Wight. In January, 1916, Mr. Clifford W. Tinson—who for three years previous to the War was Capt. F. S. Barnwell's assistant—left the Air Department of the Admiralty with the sanction of Commodore Sueter, who was then Director of Air Services, and joined the firm as designer. The design of the first Sage machine was at this time already in hand under the direction of Mr. Gordon England and Mr. L. Bonnard.



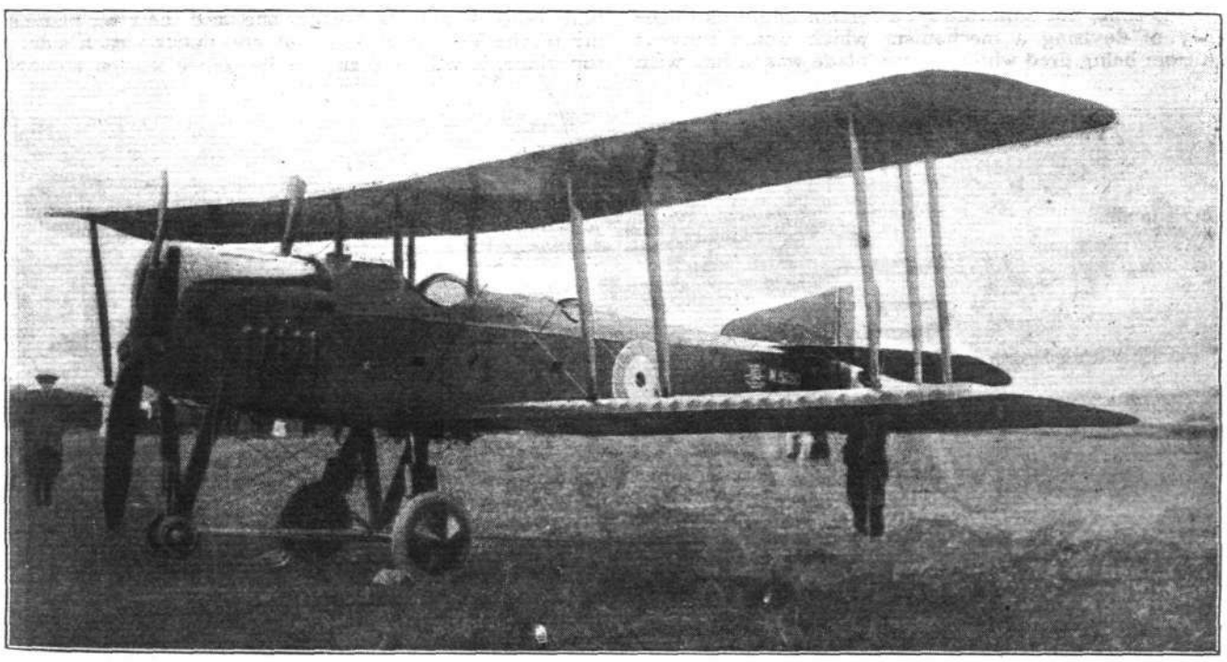
TWO VIEWS OF THE SAGE TYPE 2 : In the photograph showing the machine uncovered the gunner may be seen standing up taking aim with a machine gun.

The Sage Bomber, Type 1 (1916)

For some reason unknown to us this machine was never finished, and the figures of performance, etc., in the accompanying table must, therefore, be taken as estimates, and not as accomplished facts, although they are probably not far wrong one way or the other. As the machine was not finished no photographs of her are in existence. The plan and elevations of our general arrangement diagrams, however, give a very good idea of the lines of the machine. It will be seen that Type 1 was a twin-engine tractor, with the engines placed between the wings. The two Rolls-Royce engines—of 190 h.p. each—are placed very high in the gap between the wings, the thrust line being approximately half-way between top and bottom planes. This disposition arises from the fact that, although the *fuselage* is placed very low, the top plane is of much greater span than is the bottom one, the centre of resistance being, therefore, raised to a certain extent. Apart from their high position the engine mountings are of interest in that there is no part of the landing carriage placed under the engines. The weight is taken, when the machine is on the ground, by the anti-lift wires going from the foot of the engine-struts to the top of the centre section body struts. Whether this arrangement is advisable is, perhaps, open to doubt.

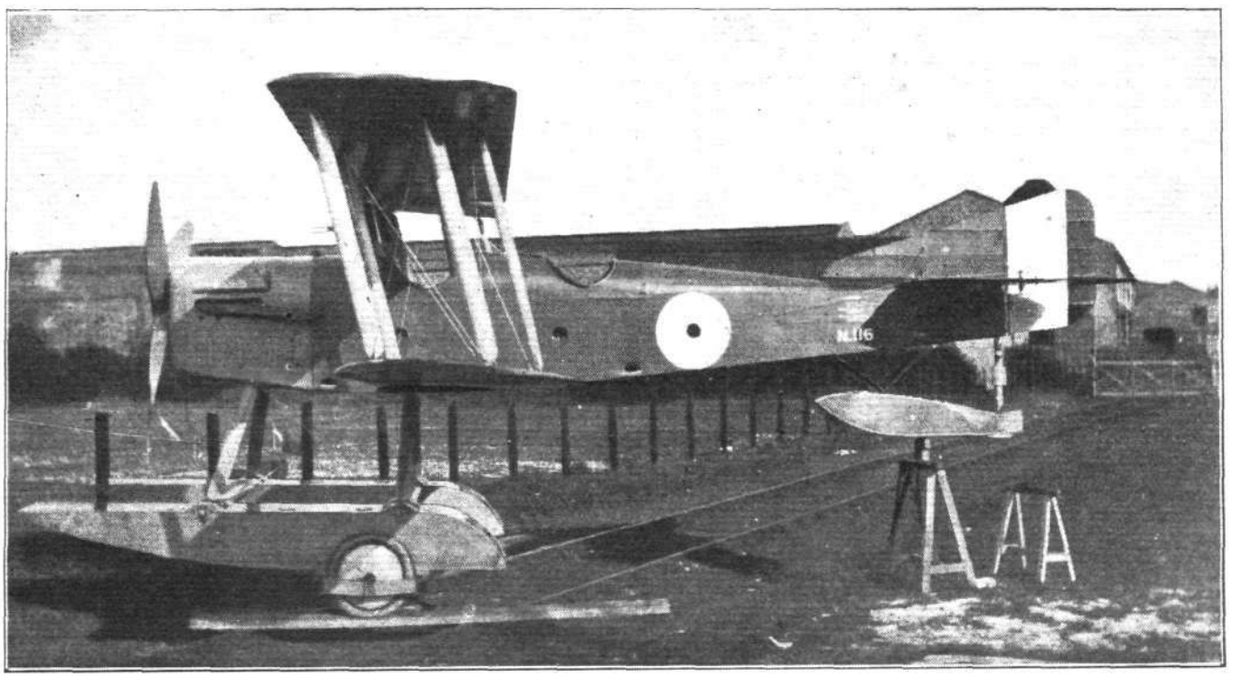
As regards the undercarriage of Type 1, this is, it will be seen, arranged along rather unconventional lines. The two main wheels are mounted direct on the body, through the bottom of which they project. The consequence of this arrangement, which obviously has for its object the reduction to a minimum of under carriage resistance, is that the wheel track is very narrow indeed, and as the lower wing is very close to the ground it has been protected by wing tip wheels of smaller diameter. In order to protect the *fuselage*, should

* Previous instalments of this series appeared as follows :—Airco machines, January 9, 1919; Bristol machines, January 23, 1919; Sopwith machines, February 6, 1919: Avro machines, March 20, 1919; Armstrong-Whitworth machines, April 3, 1919; Vickers machines, June 12, 1919. All the scale diagrams of the "Milestones" series are to a uniform scale, and are thus immediately comparable as regards relative size.



The Sage Type 3 training tractor.

the machine tend to turn over on her nose, another pair of wheels are mounted near the nose of the body, projecting through the floor in the same manner as do the two main wheels. The tail it will be seen, is chiefly remarkable as being of the biplane type. The armament of the Type 1 was to consist of three machine guns, one placed in the nose and one between the trailing edges of the planes, while a third was to be mounted immediately below the upper rear gun, and was to be fired through an opening in the floor of the *fuselage*. For its time, therefore, the Sage Bomber, Type 1, was very well armed, but as it was never finished its merits as a fighter were never ascertained. The estimated performance was quite good for the power and loading.

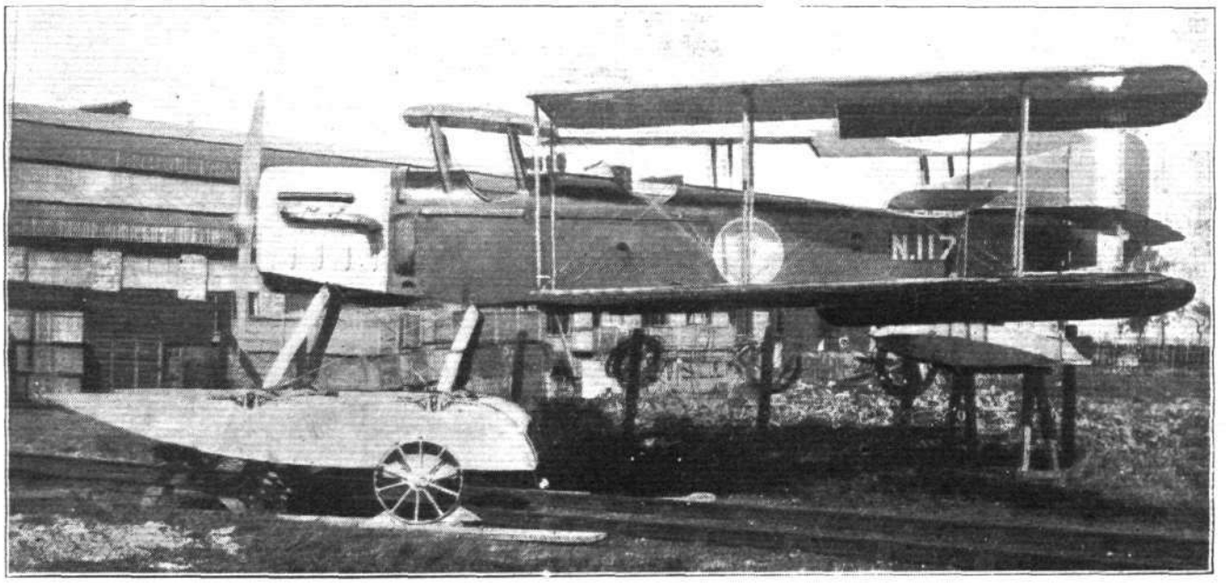


The Sage Type 4b seaplane.

The Sage Scout, Type 2 (1916)

Before synchronised gun-gears became generally adopted the tractor type of machine was of comparatively little use as a fighter, in spite of its inherent advantage over the pusher type as regards performance. In order to overcome the difficulty the Sage Type 2 was designed. As already mentioned, when this machine was first conceived, the synchronised gun had not become generally accepted, there being at the time, not unnaturally, a certain doubt as to the feasibility of devising a mechanism which would prevent the gun from being fired while a screw blade was in line with it. We say not unnaturally because on the face of it the problem of designing such a gear is a serious one, considering the speed of revolution of the screw and the rate of firing of the gun. However, at the time Sage No. 2 was conceived this problem was still being tackled, and so instead of experimenting with gun gears this firm turned their attention to the design of a machine which should mount its gun in such a position as to provide a free field of fire. It may be remembered that quite early in the War the French Nieuport firm produced a little two-seater in which the observer could stand upright with his head and shoulders projecting through a circular opening in the top plane. This was more or less the type adopted by the designer of Sage No. 2, but realising the discomfort caused to the gunner by standing upright in the slipstream of the propeller, and the effect this draught would have on the gunner's sighting, provisions were made for sheltering the gunner inside an enclosed cabin. How this was accomplished will be seen from the accompanying illustrations.

The Type 2 is a small machine, and may be said to belong to the scout class as regards dimensions, although it is designed as a two-seater. The upper plane is of greater span and chord than is the bottom one, and the inter-plane struts are of the Vee type, with but one pair on each side. The top plane, it will be seen, has its centre section mounted on



THE SAGE TYPE 4c SEAPLANE : This machine is very similar to the Type 4b, except that it has folding wings.

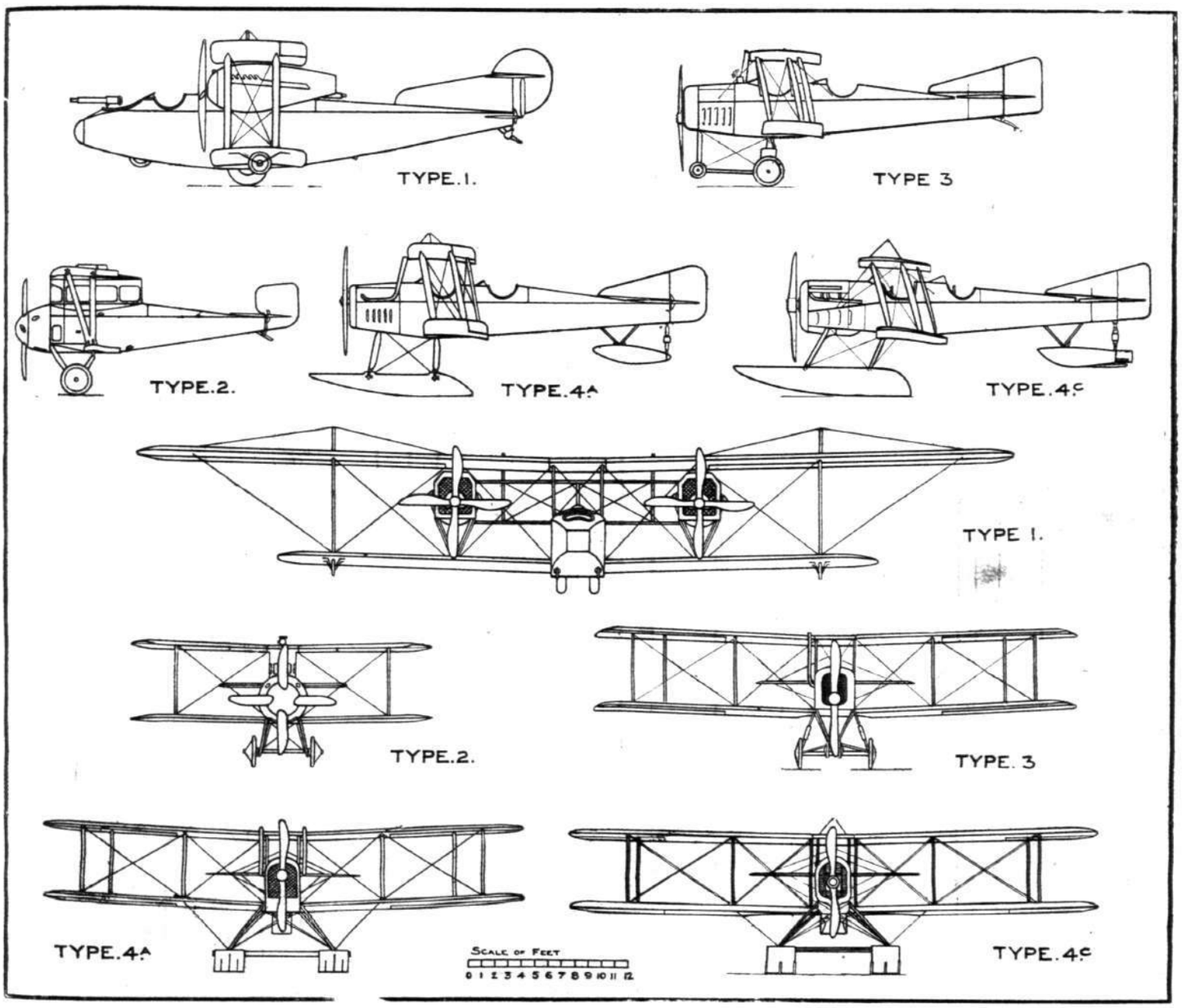
and forming the roof of a streamline structure enclosing the heads and shoulders of pilot and gunner. When standing up in his cockpit the gunner can just see over the top of the top plane, where his gun is mounted. He thus has an uninterrupted field of vision extending through the whole of an upper hemisphere. It will no doubt have been noticed that the gap of the Sage Type 2 appears to be greater than is called for by aerodynamical reasons. This is occasioned by the desire on the part of the designer to provide the gunner with a free field in a forward direction also. This—without some form of synchronised gear—was only possible by placing the gun so high that it would fire over the tips of the propeller.

It is interesting to note that in spite of the large amount of side area presented by this cabin the machine was, we are informed, quite easy to handle and appeared to be reasonably stable. During a trial flight the rudder post gave way, with the result that the machine became unmanageable and in

Table of weights, etc., and Performances of Sage Machines

Type of machine.	Engine.		Weight of machine (loaded).	Fuel capacity (gallons).		Range in miles.	Speed (m.p.h.).			Climb (in mins.) to		Ceiling.	Landing Speed.	Load/sq. ft.	Load/h.p.	Military Load.
	Type.	H.P.	lbs.	Petrol.	Oil.		Near Ground.	10,000	15,000	10,000	15,000	ft.	m.p.h.	lbs.	lbs.	lbs.
Bomber, Type 1 ..	R.R.	190	5,500	100	14	540	93	—	—	30	—	—	52	6·48	13·2	500
Fighting Scout, Type 2	Gnome	100	1,546	27½	8	308	112	109.75	104	14·75	35	16,000	55	9.22	15·48	50
Training Machine—																
Type 3A	R.R.	75	2,064	26	4	315	74	—	—	—	—	9,000	39	6.25	23·9	64
Type 3B	R.R.	75	1,980	26	4	315	76	—	—	—	—	9,000	39	6·0	26·4	—
Training Seaplane—																
Type 4A	H.S.	140	2,662	48	6	328	83·5	79	—	32	—	12,600	45	8.06	16·0	—
Type 4B	Sunbeam	200	2,709	35½	4½	220	95·5	85·1	—	25·0	—	14,400	53	8.2	13·54	—
Type 4C	H.S.	200	2,875	35½	4½	220	97·0	—	—	21·44	—	15,500	45	7·34	14·16	—

R.R. = Rolls-Royce. G. = Gnome. H.S. = Hispano-Suiza. S = Sunbeam.



Side and front elevations of the Sage machines.

landing it crashed into a tree with somewhat serious results to its wings. It was not, we think, perpetuated, probably because by then the synchronised gun-gears had been found to work well in practice.

The Sage Type 3

The next Sage machine to be designed was a two-seater tractor intended for training purposes. It was, therefore, designed with a view to good visibility, ease of handling, and low landing speed. As the machine was intended for instruction purposes she was fitted with dual control. The most unusual feature of the Type 3 is the undercarriage, which as will be seen is fitted with an extra pair of wheels in front to prevent overturning when in the hands of a novice.

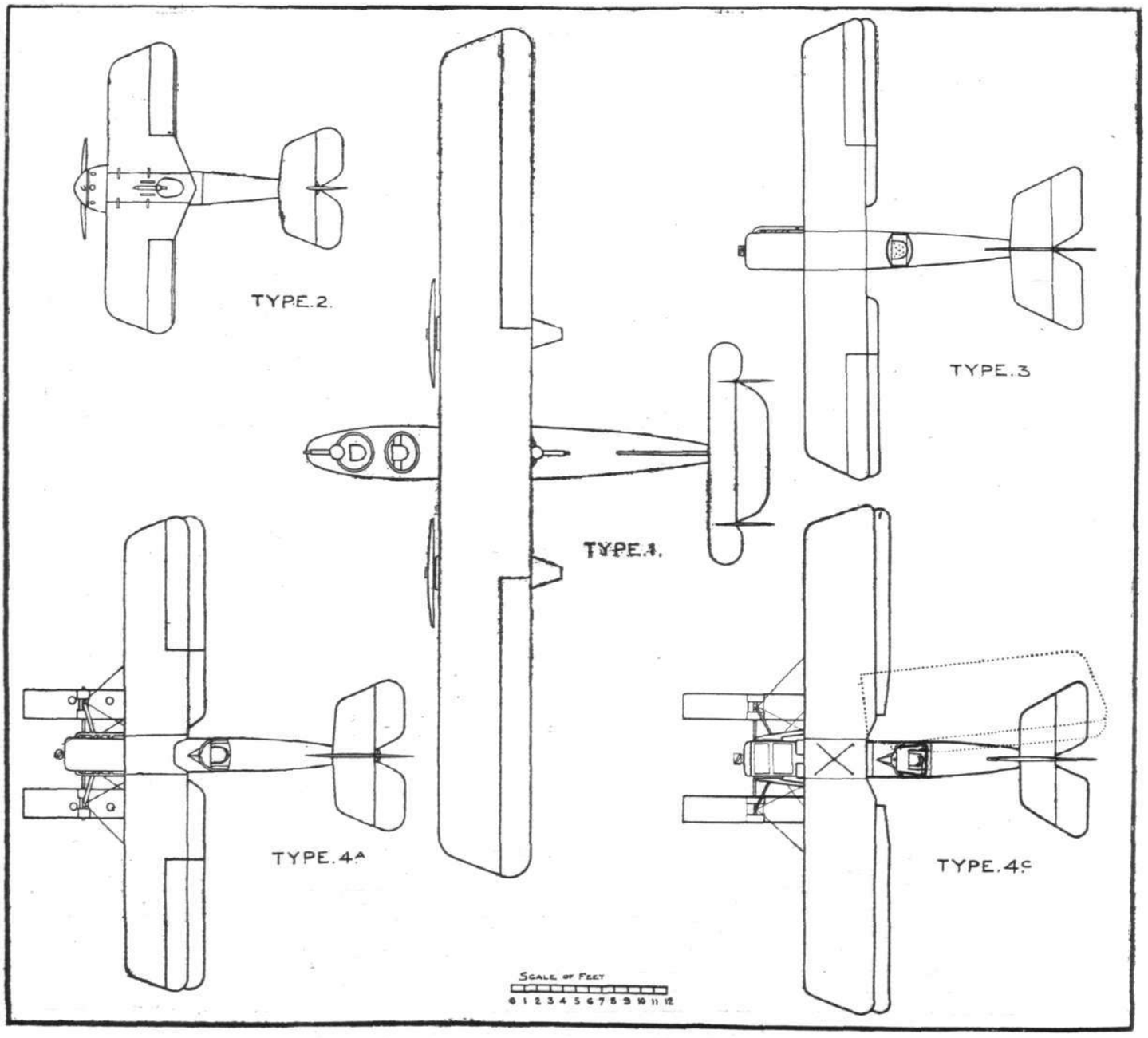
The Sage Seaplanes (1917)

Following on Sage 3 came a seaplane, which was produced in July, 1917. This machine was designed for wireless work with the Fleet. In general lines it was very similar to Sage 3, but it was fitted with a 140 h.p. Hispano-Suiza engine instead of the 75 h.p. Rolls-Royce Hawk. Also it had single control, in the front cockpit, leaving the rear cockpit clear for the wireless installation and operator. The floor under the rear cockpit was made to slide out of the way so that the wireless

Table of dimensions of "Sage" machines.

Type of machine.	Length o.a.	Wing span.		Wing chord.		Wing area.*			Incidence.		Gap.	Stagger.	Dihedral		*Aileron* area.	Area.			Area.		
		Top.	Bot.	Top.	Bot.	Top.	Bot.	Total.	Bot.	Top.			Top.	Bot.		Tail-plane.	Ele-vator.	Total.	Fin.	Rudder.	Total.
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	square feet.			°	°	ft. in.	ft. in.	°	°	sq. ft.	square feet.			square feet.		
Bomber Biplane, Type 1 ..	38 0	66 0	45 0	7 0	7 0	462	315	777	3	3	7 2	—	2½	2¼	117	440	30	74	20	15	35
Scout Biplane, Type 2 ..	21 1⅝	22 2½	22 2½	5 0	2 8	100	68	168	2	5	5 6	—	2	2	25	20	14·5	34·5	—	9	9
Training Biplane Type 3A	32 10	34 6	34 6	4 9	4 9	165	165	330	5	3	5 0	11 8	2½	2½	72	26	24	50	4	10	14
,, ,, Type 3B	32 10	34 6	34 6	4 9	4 9	165	165	330	5	3	5 0	11 8	2½	2½	72	26	24	50	4	10	14
Training seaplane, Type 4A	32 6	34 6	34 6	4 9	4 9	165	165	330	5	3	5 0	11 8	2½	2½	72	26	24	50	4	10	14
,, ,, Type 4B	34 0	34 6	34 6	4 9	4 9	165	165	330	5	3	5 3	14 7	2½	2½	72	26	24	50	5	9	14
,, ,, Type 4C	37 6	39 7½	39 7½	5 3	5 3	193	193	386	3·10	3·10	5 3	16 7	3	3	84	24·4	21·2	45·6	5½	8	13½

* Including *ailerons*.



Plan views of the Sage machines.

operator could look straight down. As in the Type 3 a very good view was obtained from both cockpits, and the type was recommended for training purposes. This entailed the fitting of dual controls, while also the nose of the *fuselage* had to be modified to take either a Hispano-Suiza of a Sunbeam Arab engine. Consequently by the time this had been done the machine was a good deal different from the original, and it was given a different series number. While the original experimental machine was known as the Sage 4A, subsequent models were called 4B and 4C respectively. The latter two models were very similar in appearance, but whereas the 4B type had rigidly fixed wings, the 4C type was provided with folding wings. The increase in power, of from 140 h.p. to 200 h.p., naturally improved the performance, in spite of the additional weight of the engine and dual controls. The last machine turned out before the Armistice had a speed range of from 45 m.p.h. to 97 m.p.h., and climbed 10,000 ft. in 21 minutes.

The chief feature of all the Type 4 machines is the ease with which they can be stunted, and at the same time they are very stable, the pilot on one occasion leaving the machine to itself at 400 ft. and flying for a distance of about 50 miles.

Investitures: Distinguished Flying Cross and Air Force Cross

IT is notified by the Air Ministry that officers should understand that they cannot be allowed to present themselves for Investiture unless they receive a summons to attend from the Lord Chamberlain's Department. Officers who have not received instructions to attend will understand that their names remain noted for another occasion, and that no further action is required of them. It is not practicable to indicate beforehand when Investitures will be held at which any individuals will receive his decoration.

There are now sufficient applications in hand to occupy a considerable time, and no further names are therefore required until about September 1, 1919.

Service dress should be worn by serving officers and by officers demobilised or released from service if so desired, otherwise morning dress (frock coat or morning coat) should be used.

Investitures for the Order of the British Empire will be arranged next October, and applications for attendance may be submitted to the Air Ministry at any time after October 1, 1919.

British War Medal, 1914–1918, for the R.A.F.

HIS MAJESTY THE KING has been graciously pleased to signify his pleasure that a medal be granted to record the bringing of the war to a successful conclusion, and the arduous services rendered by His Majesty's Forces.

The medal, in silver, will, provided the claims are approved by the competent Royal Air Force authorities, be granted to the undermentioned classes who either entered a theatre of war on duty, or who left their places of residence and rendered approved service Overseas, other than the waters dividing the different parts of the United Kingdom, between August 5, 1914, and November 11, 1918, both dates inclusive:—

(*a*) Officers, warrant officers, attested and enrolled non-commissioned officers and men of the Royal Naval Air Service, Royal Flying Corps or Royal Air Service.

(*b*) Members of women formations employed under a direct contract of service with the Royal Air Force Medical Service.

(*c*) All who served on staffs of Royal Air Force hospitals and all members of recognised organisations who actually handled sick and wounded.

(*d*) Members of duly recognised or authorised organisations.

The medal will also be granted to all officers, warrant officers, attested and enrolled non-commissioned officers and men of the Royal Naval Air Service, Royal Flying Corps and Royal Air Force who:—

(i) Have been actively engaged in the air against the enemy whilst borne on the strength of an operational unit in Great Britain.

(ii Have been employed in flying new aircraft to France.

(iii) Have formed part of the complement of an aircraft carrying ship.

The medal, in bronze, will be granted to all British subjects who were enrolled as followers or members of Native Labour Corps units and who served in theatres of war.

The riband will be—centre orange, watered, with stripes of white and black on each side and with borders of royal blue.

Instructions as to the submission of claims and the disposal of the medals will be issued in due course.

Air Force Secrets

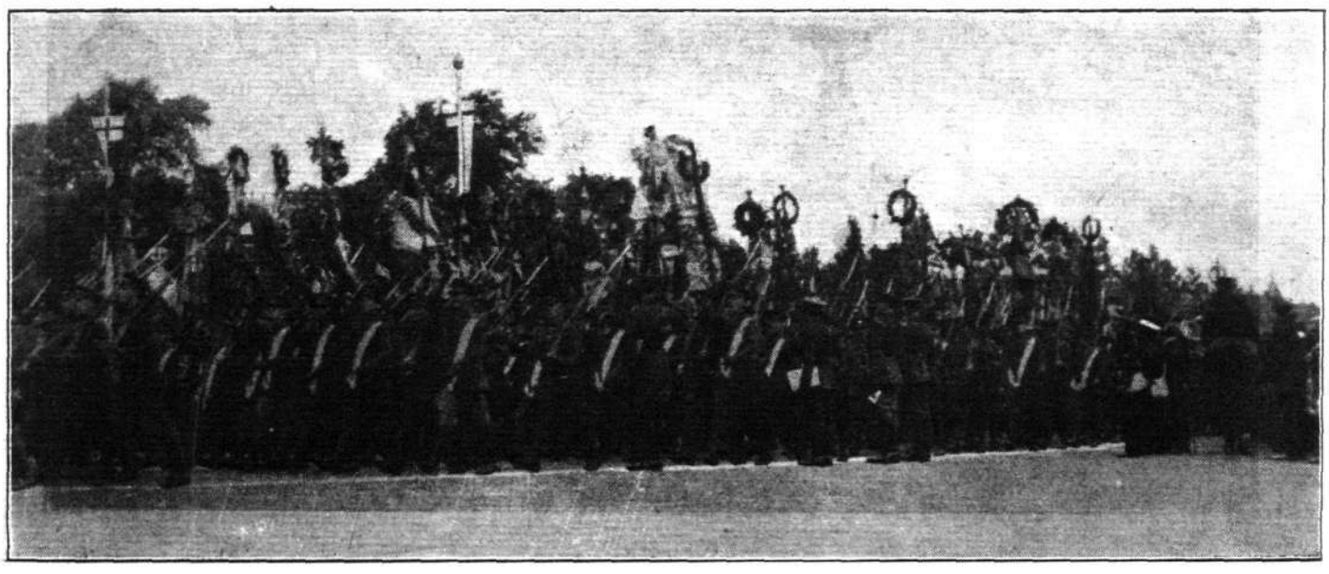
THE Air Ministry calls the attention of all persons who have served but are no longer serving in the R.A.F., the R.N.A.S. and the R.F.C., or who have been employed either directly or indirectly by the Government in research or experimental work in connection with flying, or engaged in the manufacture of aircraft, or parts, or accessories of aircraft, to the fact that no information obtained through secret and confidential service publications or technical apparatus, or in any other manner consequent upon their employment by the Government, as above mentioned, may be disclosed to any other person without the written consent of the Air Ministry.

Disclosure of information so obtained may constitute an offence under the Official Secrets Act, and attention is directed to the obligations and penalties imposed by that Act.

Air Ministry's New Home

THE Air Ministry is being removed as quickly as possible from its present home at the Hotel Cecil to three adjoining buildings in Kingsway—Empire House, India House, Canada House. All communications should now be addressed to the Air Ministry, Kingsway, W.C. 2.

The official entrance to the Ministry will be in Empire House, but letters and parcels should be delivered at the Canada House entrance.



"Flight" Copyright.

"THE COLOURS OF THE GUARDS" in Peace Day Procession, July 19, 1919.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

THE FLYING SERVICES FUND

A MEETING of the Flying Services Fund Committee was held on Wednesday last, July 16, 1919, when there were present :—Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F., in the Chair, Mr. Chester Fox and Mr. B. Stevenson, Assistant Secretary.

Grants and Allowances.—The following Grants and Allowances were made :—

(41) An allowance of £3 a month for three months to the mother of a C.P.O. II in the Royal Naval Air Service who had been killed on active service.

(45) A Grant of £5 to an Ex-1st Class Air-Mechanic in the Royal Flying Corps who had been incapacitated on active service.

(74) A Grant of £10 to the mother of a Corporal in the Royal Flying Corps who had been killed on active service.

(83) An allowance of £3 a month for six months to the widow of a 1st Class Air-Mechanic in the Royal Flying Corps who had been killed on active service.

(116) An allowance of £4 a month for six months to the widow of a 3rd Class Air-Mechanic in the Royal Air Force who had been killed on active service.

(132) An allowance of £1 a month for six months to the mother of a Private in the Royal Air Force who had died on active service.

(134) An allowance of £2 a month for six months to the widow of a Sergeant in the Royal Flying Corps who had died on active service.

(138) The school fees, etc., for at least one year, of the child of the widow of a Private in the Royal Air Force who had died on active service.

(188) An allowance of £1 a month for six months to the widow of a Private in the Royal Air Force who had died on active service.

(220) An allowance of £2 a month for twelve months to the mother of a Sergeant in the Royal Air Force who had been killed on active service.

(221) An allowance of £1 10s. a month for six months to the widow of a Sergeant in the Royal Air Force who had died on active service.

(223) An allowance of £2 a month for six months to the widow of a 2nd Class Air-Mechanic in the Royal Air Force who had died on active service.

(226) An allowance of £2 a month for six months to the widow of a Corporal in the Royal Air Force who had died on active service.

(227) An allowance of £2 a month for six months to the mother of a 2nd Class Air-Mechanic in the Royal Air Force who had been killed on active service.

(229) An allowance of £2 a month for six months to the mother of a 2nd Class Air-Mechanic in the Royal Air Force who had died on active service.

(230) An allowance of £1 10s. a month for three months to the mother of a 3rd Class Air-Mechanic in the Royal Air Force who had been killed on active service

(231) An allowance of £2 a month for three months to the mother of a 2nd Class Air-Mechanic in the Royal Air Force who had been killed on active service

(232) An allowance of £1 10s. a month for three months to the widow of a 1st Class Air-Mechanic in the Royal Air Force who had died on active service.

(233) An allowance of £1 a month for six months to the widow of a Private in the Royal Air Force who had died on active service.

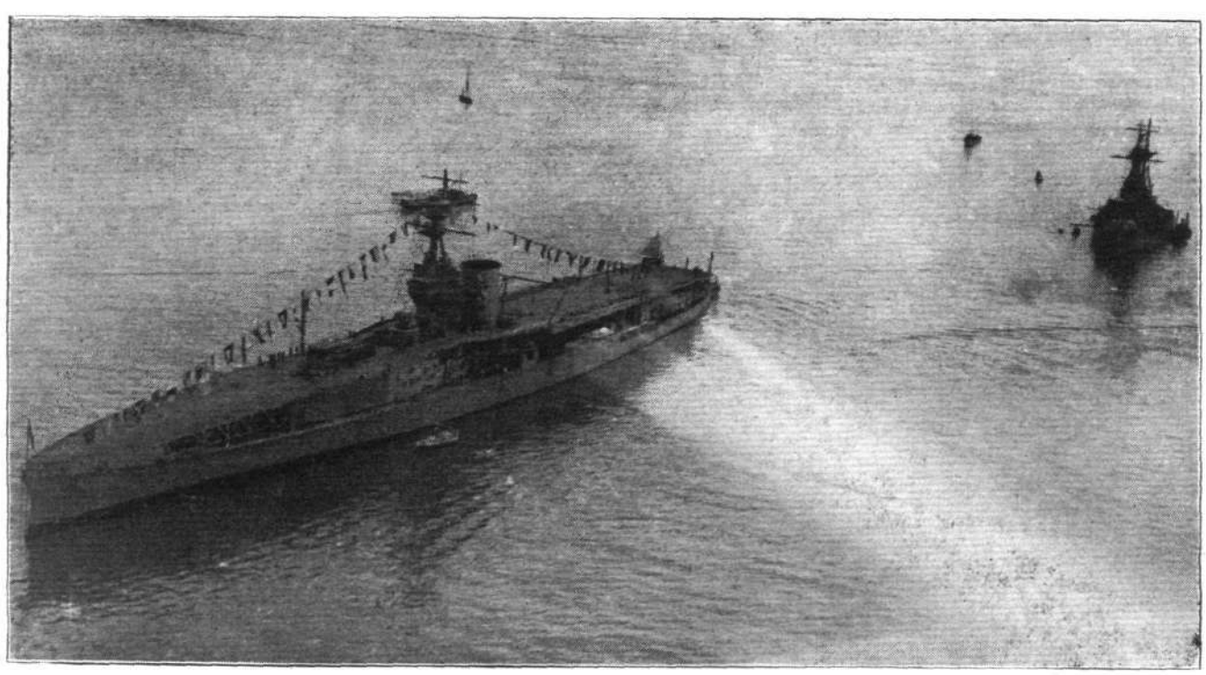
Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary.

Doctors Wanted for R.A.F.

THE Air Ministry announces that the Royal Air Force requires the services of a limited number of medical practitioners, including those who have already served. All candidates must be fit for general service at home and abroad, should be under 35 years of age, and must be willing to fly, if called upon to do so.

The terms of service are :—Candidates who have served before will be commissioned in their previous substantive rank, those who have not served will be commissioned as Lieutenant. The period for engagement to be for one year or until no longer required, whichever shall first happen. Pay to be at the rate of £550 a year, inclusive of all allowances, except travelling allowances and expenses when travelling on duty, and rations or the allowance in lieu. Outfit and kit allowance will be issued to candidates who have not received them for previous service.

Applications should be addressed to the Secretary, Medical Department, Air Ministry, London, W.C. 2.



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H.M.S "Furious," in line with the fleet at the mouth of the Thames on Peace Day, July 19. Photographed from above

FLIGHT

ROYAL AIR FORCE PAY

THE following official statement with reference to the revised rates of pay for officers of the Royal Air Force was issued on Monday last :—

1. The rates of pay, pensions, and allowances for officers of the R.A.F. have been under review, and the standard rates now authorised are as shown in the accompanying statements. The present system, under which the various branches each had their own rates of pay, has been replaced by a uniform system of rates for all branches, with the exception that certain specialist services (such as medical and dental) will continue to have special rates as hitherto. These specialist services will be dealt with separately, except in so far as reference is made to them below.

2. The rates have been fixed with reference to the present high cost of living, and it has been decided that 20 per cent. of the rates of pay and retired pay will be considered as due to the present high cost of living, and will be subject after five years to change, either upwards or downwards, according as the cost of living rises or falls. Subsequent revisions will be made at three-yearly intervals on the basis of Board of Trade food prices.

3. The new rates will not apply to officers awaiting demobilisation or who are temporarily retained. They are intended for those officers who are given permanent or short-service commissions in the Force as reconstituted, or who are seconded to the Royal Air Force from the other Services.

Pay

The rates will be as follows, and will apply generally to officers (including Staff officers) performing duties of the present Flying, Technical, and Administrative branches :—

Rank.	Pay per diem. £ s. d.
Cadet	0 5 0
Cadet after 1 year	0 10 0
Second Lieutenant	0 18 0
Lieutenant	1 3 0
Lieutenant after two years as such	1 5 0
Captain	1 9 0
Major	1 14 0
Major after 5 years as such	1 16 0
Lieutenant-Colonel	2 0 0
(Rising by 1s. per day after each year to a limit of £2 10s.)	
Colonel	2 15 0
Colonel after 2 years as such	2 18 0
Colonel after 4 years as such	3 1 0
Colonel after 6 years as such	3 4 0
Brigadier-General	3 4 6
Brigadier-General, Command Pay	0 5 0
Major-General	5 0 0
Lieutenant-General	6 0 0
General	7 0 0

Special Rates for Quartermasters

—	Rank.	Pay per diem £ s. d.
On appointment	Lieutenant	0 19 0
After 4 years	Lieutenant	1 1 0
After 8 years	Captain	1 3 0
After 12 years	Captain	1 5 0
After 15 years	Major	1 10 0
	Lieutenant-Colonel	1 15 0

(The establishment of Lieutenant-Colonels will be a very small one.)

Special Rates for Chaplains

	Rate per diem. £ s. d.		Rate per diem. £ s. d.
On entry	1 0 0	After 18 years	1 18 0
After 3 years	1 3 0	After 21 years	2 1 0
After 6 years	1 6 0	After 24 years	2 4 0
After 9 years	1 9 0	After 27 years	2 7 0
After 12 years	1 12 0	After 30 years	2 10 0
After 15 years	1 15 0	Chaplain-in-Chief	£1,000 p.a.

Temporary Chaplains in the Royal Air Force will receive a gratuity of £50 for each complete year of service, subject to conditions to be hereafter published.

Medical officers will receive the same rates of pay as may be approved for the Medical Service of the Army.

Pay of Officers Employed at the Air Ministry

Rate

Directors, £2,000 per annum .. .. .. } Consoli-
Deputy Directors, 1st Class, £1,500 per annum .. } dated
Deputy Directors, 2nd Class, £1,200 per annum .. } rates.

Other officers.—Down to and including the rank of Major.—Full pay and allowances, *plus* £100 per annum. Below the rank of Major.—Full pay and allowances, *plus* £75 per annum.

Attached officers.—Full pay and allowances of their rank, *plus* 10s. a day up to three months ; thereafter they will come on to the ordinary Air Ministry scale.

Allowances

The allowances will be as given below, and will be reviewed periodically :—

Table Money.—Is under consideration.

Subsistence and Travelling Allowances

—	Up to 8 nights in one place.		After 8 nights.		Daily absence 5-9 hours.		Daily absence over 9 hours.	
	s.	d.	s.	d.	s.	d.	s.	d.
A. Rank of Colonel (or similar staff grading) and upwards	30	0	15	0	6	0	15	0
B. Below rank of Colonel	22	6	12	6	4	0	11	6

Lodging, Fuel, Light and Ration Allowances

Home Stations.—The standard rates will be as follows :—

	Lodging.	Fuel and Light.	Rations.
	Per diem. s. d.	(average) Per diem. s. d.	Per diem.
2nd Lieuts. and Lieuts.	3 6	1 0	No change
Capt., Maj., and Lt.-Col.	4 6	2 0	No change
Other officers	No change	Increase of 1s. per day.	No change

Note.—Married officers over 30 years of age for whom no married quarters are available and who are, therefore, obliged to provide accommodation for themselves and for their families, may draw lodging, fuel, and light allowances.

Servants' Allowance.—2s. for each authorised servant at home and abroad if no servant is provided.

Field Allowance.—To be granted to all officers on active service in the field, and to be issuable whenever officers are under canvas. The rate is still under consideration.

Children's Allowance.—Existing rates of children's allowance will continue until the end of 1919, after which they will be abolished. In the meantime children's allowance will be continued, and officers now receiving the allowance will not become ineligible for it if the effect of the increases in pay now granted is to raise their salaries beyond the limit of income laid down for the grant of the allowance.

Colonial Allowance.—The same as for the Army.

Conveyance of Families.—The cost of conveying the wives, families and baggage of officers will be charged to the public only in respect of changes of station in this country.

Furniture Allowance and Charges.—Furniture allowance and furniture charges are abolished. In future all quarters, including the commanding officer's quarters, will be furnished.

Mess Allowance.—This allowance is abolished.

Travelling Concessions.—The question of the continuation (*a*) of the rule allowing officers proceeding on leave two free passes a year, (*b*) of the reduced fare for officers travelling on leave, is still under consideration.

Pensions

(Applicable to officers performing duties of the present Flying, Technical, and Administrative Branches.)

A.—*General Officers*

Lieutenant-General.—£975 after 24 years' service, increased by £22 for each year beyond 24, with a maximum of £1,195.

Major-General.—£790 after 22 years' service, increased by £22 for each year beyond 22, with a maximum of £1,010.

Brigadier-General.—£650 after 20 years' service, increased by £22 for each year beyond 20, with a maximum of £950.

An officer must complete three years' service in any of these ranks before being entitled to the special pension attaching to it. This condition will not, of course, affect his title to the pension earned by service in the ordinary way, and an

officer may reckon service as lieutenant-general or major-general towards his service in a lower rank if that would entitle him to special pension for that lower rank.

B.—*Colonels and Lower Ranks*

There will be a minimum qualifying period for pensions—20 years. Subject to this the scale is as follows :—

—	Age.	Retired Pay.	Service.	Addition for each extra year of service.*	Reduction for each deficient year of service.*
		£			
Cols. retire at 55, max. ret. pay £900	55	790	24	22	15
	54	765	24	22	15
	53	742	23	22	15
	52	720	23	22	15
Lt.-Cols. retire at 48, max. ret. pay £600	51	697	22	22	15
	50	675	22	15	15
	49	637	21	15	15
	48	600	21	15	15
Majs. retire at 45, max. ret. pay £450	47	562	20	15	15
	46	525	20	15	15
	45	487	19	15	15
	44	450	19	15	15
Capts. and subalterns ret. at 40, max. ret. pay £400 ..	43	412	18	15	15
	42	375	18	15	15
	41	337	17	15	15
	40	300	17	15	15

* Limited to 5 years.

Gratuities to officers who retire before qualifying by length of service for Service pensions :—

A gratuity of £75 for each completed year of service will be awarded, with a maximum of £1,000, provided that no officer is to be allowed to resign with a gratuity unless he has completed 10 years' service.

While these pension scales will be applicable generally to officers appointed to perform the duties of the present Flying Technical and Administrative branches, including chaplains, the following will be dealt with under special regulations which will shortly be issued :—

Officers seconded from the Navy and Army. Officers who may be appointed as Quartermasters on the special Quartermasters' rates of pay.

Commissioned Warrant Officers, Warrant Officers and Ratings from the Royal Navy on regular engagements who have been given temporary commissions in the R.A.F.

Warrant Officers, N.C.O.s and men from the Army on regular engagements who have been given commissions in the Army or were given temporary commissions in the R.A.F.

It should also be noted that these scales do not apply to specialist services such as Medical and Dental officers, Pay officers and Schoolmasters.

Notes

1. The application of these standard rates of pay, pensions and allowances to the existing and future *personnel* will be carried out under administrative regulations which will shortly be published.

2. The new rates will begin to take effect from the date of the first *Gazette* containing the names of officers appointed to permanent and short service commissions in the Royal Air Force. They may begin at somewhat later dates for officers not dealt with in the first *Gazette*.

EX-R.A.F. OFFICERS' CLUB IN THE CITY

WITH the double purpose of celebrating Peace and of drawing attention to the existence of such an institution the members of the ex-R.A.F. Officers' City Luncheon Club, ("Ye Olde Birdes") held a Victory Luncheon on July 17 at their meeting place at the Mansion House Restaurant, in Queen Victoria Street, E.C.

Maj. C. O. F. Modin, D.S.C. (chairman of the club) presided, and the guests included Maj.-Gen. Sir W. S. Brancker, Col. W. O. Beatty, Col. J. T. C. Moore-Brabazon, M.P., Lieut.-Col. L'Estrange Malone, M.P., Mr. W. Joyson-Hicks, M.P., Mr. A. Baldwin Raper, M.P., Sir Charles Wakefield and Sir Edward Mountain.

The Chairman in a commendably brief speech proposed the toast of "Success to British Aviation."

Maj.-Genl. Sir W. S. Brancker, in responding, said that they had had a wonderful five years in the air, and he thought they could say without boasting, that British aviation had fought its way from very small beginnings to an absolutely paramount position in the world. When the Armistice was signed our most bitter rivals frankly admitted the superiority of our pilots, and our systems of training, organisation, and leadership. Apart from that we had also led the world in policy by the creation of an Air Ministry and the R.A.F.

Another factor in our success was our powers of organisation and our ability to carry out schemes thoroughly and efficiently. The life-blood of commercial aviation of the future was organisation. If we played our cards properly and went ahead on the right lines, the success of British aviation in the future was assured. At the moment the situation was somewhat difficult. The whole world was talking of aviation, but very little really was being done. A great deal of capital and lengthy preparations were necessary before any great imperial air routes could be made a paying proposition.

At the monent, aircraft construction was languishing. War orders had finished and peace orders had not come in and would not do so for some time. The Air Ministry was torn between an enthusiastic Press and a cold and unsympathetic Treasury, which has not yet been bitten by the "bug" of aviation. A committee had been appointed, with Lord Weir at its head, to study the question of air routes. He had absolute confidence that the report which they produced would be most sound and useful, and when the Government considered that report he hoped they would remember that the future of the Empire would probably depend on our power in the air, just as it had depended upon our power on the sea.

Col. Moore-Brabazon proposed "The Old Birds' Club" warmly, the idea of the club as a means towards fostering the spirit of brotherhood which had done so much towards inspiring the flying officers in their gallant work.

Mr. Leslie Guyer briefly responded.

The club, which was opened in May this year aims at providing a meeting place where demobilised officers of the R.A.F. can spend the luncheon interval in congenial surroundings and keep in touch with one another. All ex-officers of the R.A.F. are eligible for membership, and hon. membership is extended to all serving officers and members of the Royal Air Force Club, Bruton Street.

Triple Fatality at Farnborough

WHILE an Avro and a S.E. 5 were flying at Farnborough on July 14 they collided, and Lieut. A. Herbert and Mechanic C. Hieley, of the former machine, and Lieut. H. A. P. Bizion were killed. At the inquiry held by the Coroner, the evidence threw no light on the cause of the accident. It was stated that the authorities had held an inquiry and were satisfied that the disaster was entirely accidental. The Coroner recorded a verdict of "Accidental Death."

Baroness de la Roche Killed

IT appears almost ironical that the Baroness de la Roche, who was the first woman pilot, should have been killed while flying as a passenger. What happened is not very clear, but it would seem that the machine in which she was flying, overturned during a trial flight. Baroness de la Roche was killed instantly and the pilot, Barrault, died very shortly afterwards. Baroness de la Roche, secured her pilot's certificate in France on March 8, 1910, having qualified on a Voisin biplane, and in the following November she won the Femina Cup with a flight of 200 miles. During the War she tried without success to join the French Air Service. A few weeks ago she took a machine up to a height of 4,900 metres (16,170 ft.) but the French Club refused to recognise" women's records," a decision which has caused some discussion across the Channel.

The Death of Lieut. Navarre

BY an accident at Villacoublay on July 10, France lost another of her famous aces, Lieut. Navarre, who held the lead in the French Flying Corps for some time until he was wounded in 1916. The cause of the accident has not been ascertained; he was trying a new machine, and Capt. Mado, who witnessed the accident, thinks the pilot was overcome by a fainting fit.

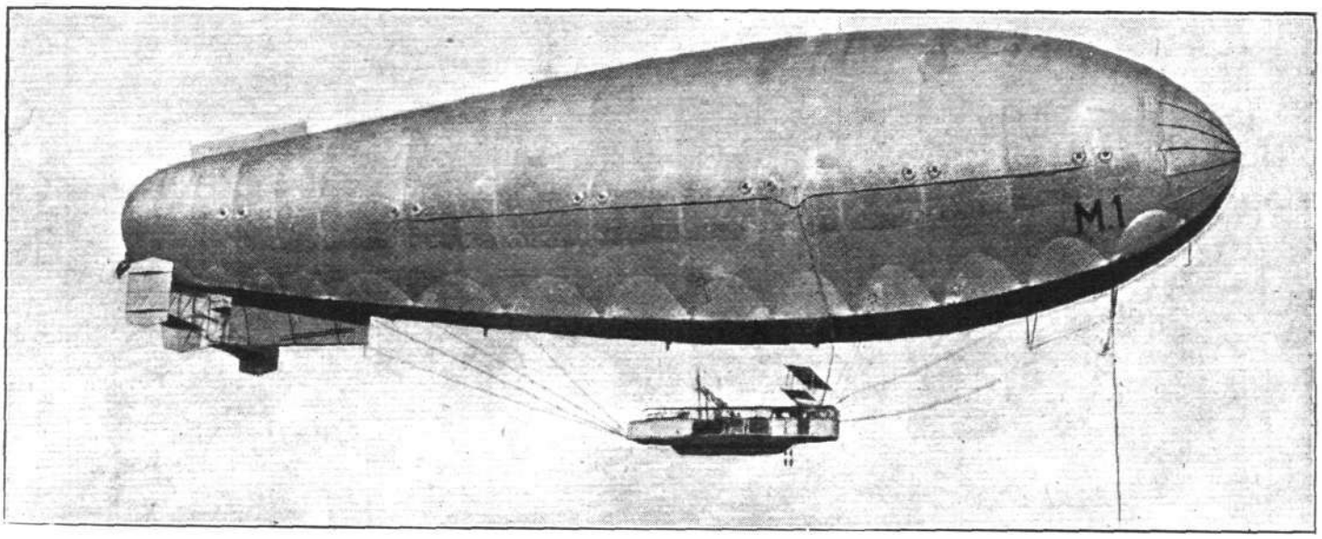
FLIGHT

AIRSHIPS

THE BRITISH NAVY AIRSHIP S.R. 1, ITALIAN "M" TYPE

ON July 2 an airship, bearing the title S.R. 1 on its envelope, flew leisurely over London for some considerable time to assist the Victory Loan. People in the metropolis have become accustomed to see the North Sea airships and also the Zeros and Twins, moreover on occasions they have been vouchsafed glimpses of still larger aircraft such as the rigids R 23 and R 26, but this type of airship was something entirely different and occasioned universal curiosity and speculation. As a matter of fact this is the only airship of its kind in the country and though owned by the Navy and bearing the British identification marks is of I alian design and manufacture.

S.R. 1 is an abbreviation for semi-rigid 1, a design as distinct and separate as the rigid and non-rigid, which has been exploited largely by the Italians. Except in the case of the smallest type of vessel, similar in many respects to our own S.S. Zero, all Italian airships are of semi-rigid design, and vary in capacity between the 141,000 cub. ft. of the Usuelli and the 635,000 of the Forlanini.



The Italian "M" 1 Airship, which is the forerunner of the S.R. 1.

The most successful of the various types of airships is undoubtedly the M class, and following a visit to Italy made by several airship officers in 1917, a decision was made to purchase a ship of the latest M design for experimental purposes. This ship, known as S.R. 1, was completed in September, 1918, and was flown from Italy to this country after an arduous voyage during which much bad weather was encountered. A short description of this airship will show the many salient differences in construction and design from those with which we in this country are more familiar.

The envelope, composed of two-ply fabric, has a capacity of 450,000 cub. ft., or nearly 100,000 cub. ft. more than that of our North Sea airship. It is divided into six separate gas chambers by means of varnished silk diaphragms, while the air balloonet extends along the total length of the bottom of the envelope and is 45·9 per cent. of the envelope volume, equivalent to a rise of 15,000 ft. Fourteen air valves are disposed along the bottom of the envelope fitted with opening and closing controls. The balloonet is charged with air through a valve of the shutter type situated in the nose of the ship. Each of the six gas chambers is fitted with two gas valves, on the starboard side of the envelope about half-way up. The keel which renders the ship semi-rigid, is composed of triangular girder sections formed of high-tensile steel tubing and runs throughout its entire length. All the connections are universal joints, which allow the keel to take up the different angles occasioned by the various stresses and strains. The car, as compared with those designed for British airships, is entirely devoid of comfort, and provides the scantiest accommodation for officers and men. The frame is made entirely of steel tubing with a flooring of wood.

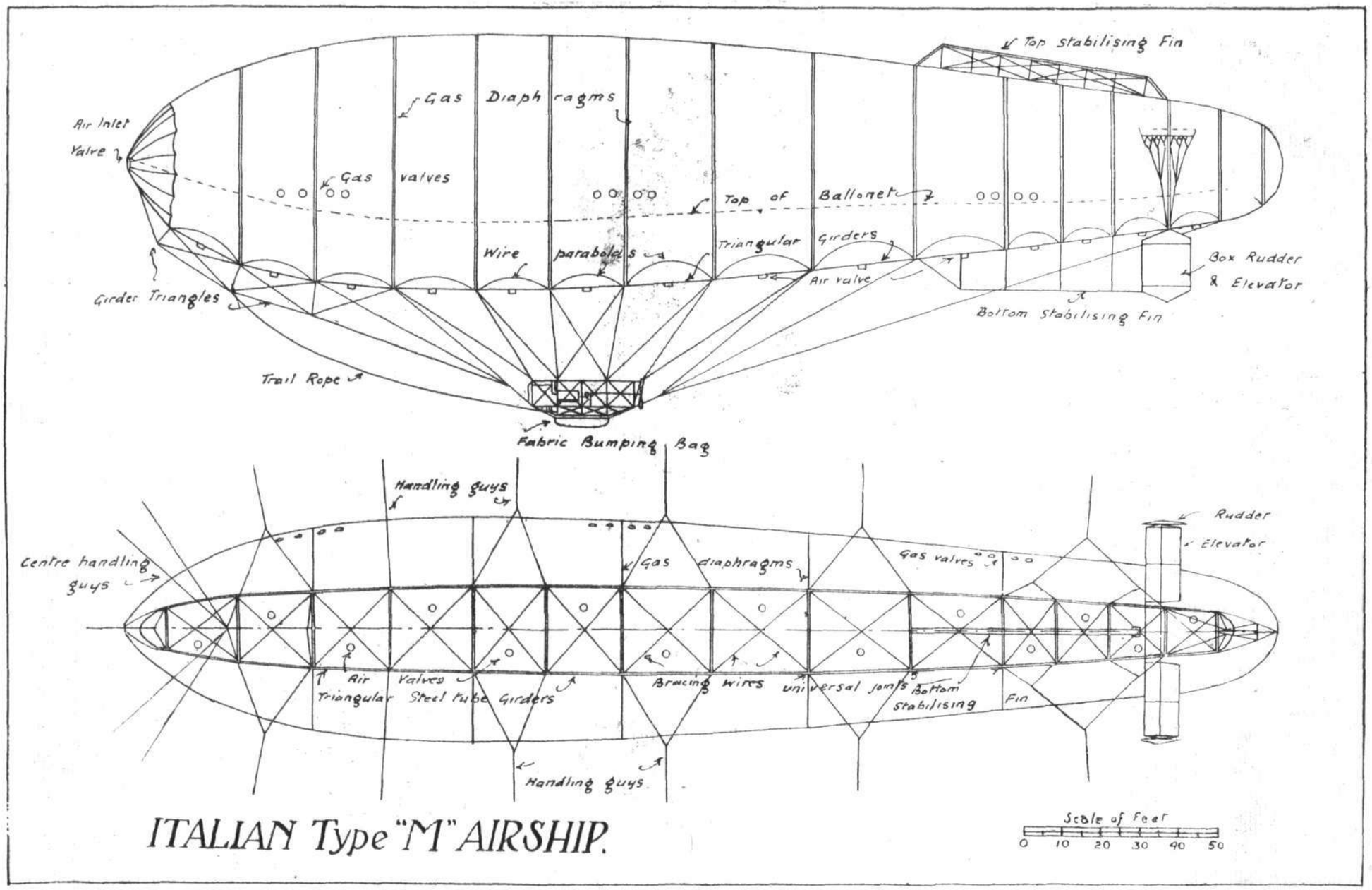
The control position is at the forward end of the car, where are placed the steering and elevating wheels. The valve controls and pressure tubes are also lead to this portion of the car. Engine power is provided by two Itala-Maybach engines which are mounted on either side of the car about 9 ft. from the forward end, the framework being specially strengthened at these points. Each engine drives a single propeller astern of the car through long driving-shafts which are supported by struts from the car and wire suspensions from the keel. Through these tubes runs the drive for changing the angle of the propeller blades. Petrol and water ballast tanks are carried in the car.

The car is suspended by wire cables attached to the joints of the keel girders. These are supported in their turn by parabolic wires sewn into the envelope and connected at each end to the side girders. The keel itself is also connected to the envelope by means of flexible cables which are attached to the ends of all the cross girders of the keel. These cables meet in the form of inverted V's, and pass through the balloonet as single wires to a point about two-thirds of the envelope's height. Here the wires again separate, and the ends are attached to two canvas bands suspended from each end of the envelope near the top. These canvas bands run for the entire length of the envelope. The ship is fitted with top and bottom stabilising fins, composed of girder work covered with fabric.

The elevators and rudders are designed on the box-rudder principle, which is still adopted in all airships in Italy, but which has been abandoned in all modern airships both in this country and in Germany. In Italy, according to all reports, they are considered to be highly efficient and are light and strong

To summarise, the dimensions and performances of this class of airship are as follows :—

Length	290 ft.
Diameter	58 ft.
Overall height	72 ft.
Disposable lift	7,700 lbs.
Speed	46–50 m.p.h.



THE BRITISH NAVY AIRSHIP S.R.1, ITALIAN "M" TYPE: Plan and elevation to scale.

It is capable of reaching a height of 17,000 ft. with a crew of five.

As mentioned before, the purchase was made for purely experimental reasons, as the authorities of this country had had no experience with a semi-rigid airship of modern design. For practical purposes she is too slow for the work that would be required of our naval aircraft, and her powers of endurance are insufficient for our needs. In Italy, however, the conditions for War purposes were entirely different, as the following three main reasons will prove :—

(*a*) Height was of primary importance.

(*b*) Speed was of secondary importance.

(*c*) Flights were never of long duration.

Height was of the utmost importance as these ships were used for bombing the Austrian ports, and enemy gunfire had to be avoided at all costs.

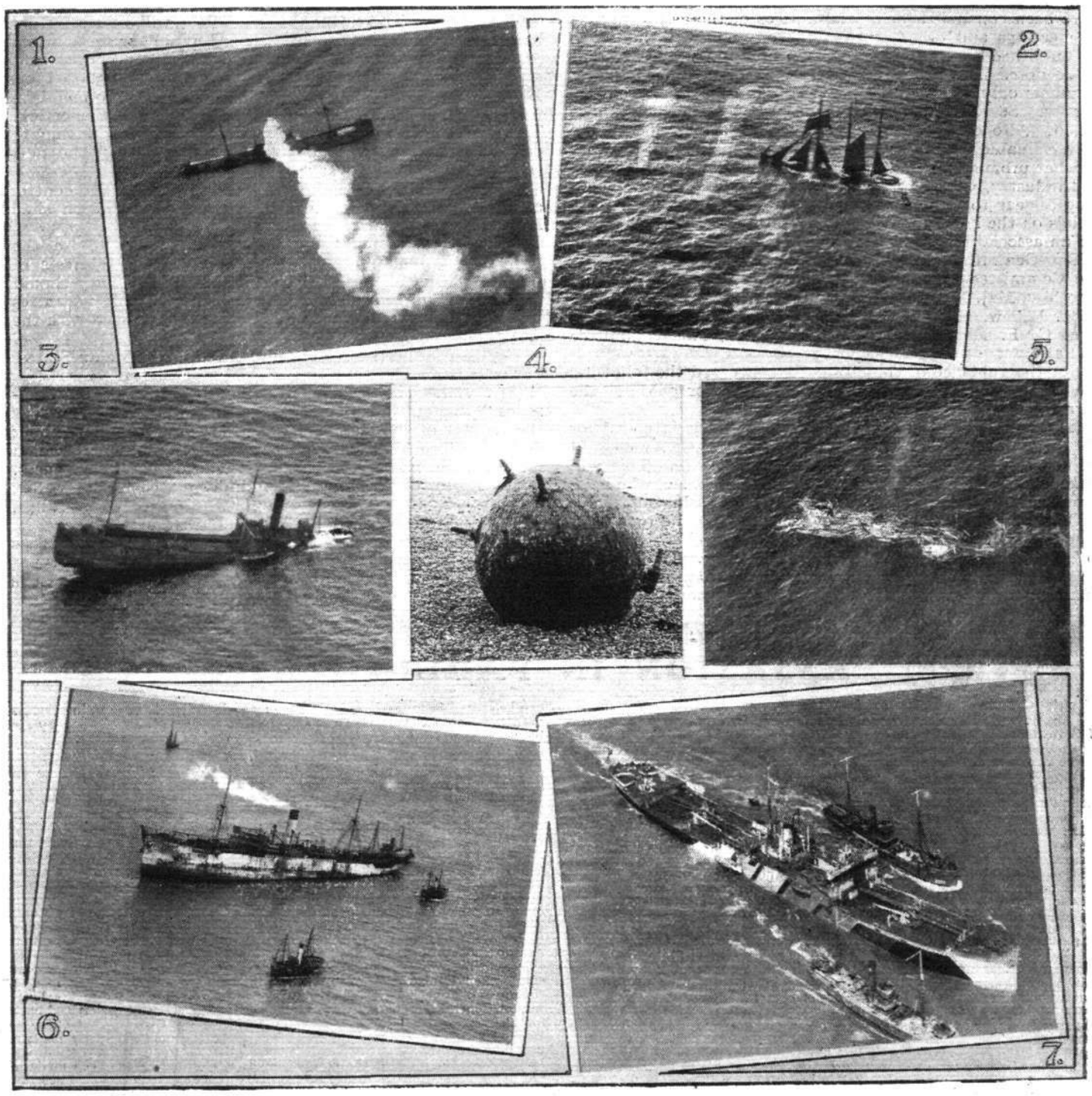
Speed was of minor importance, as the prevailing winds of Italy are of very low velocity.

The duration of flights as carried out by the Italians averaged six hours for a bombing cruise and twelve hours for anti-submarine patrol.

When it is considered that patrols of over 24 hours were quite a common occurrence for our airships during the War, it will be seen that a comparison, for instance, with the North Sea type of airship, is absolutely futile.

S.R. 1 arrived in England only a short time before the signing of the Armistice. There was, therefore, but little opportunity of using her for War purposes, although on the occasion of the surrender of the German submarines she met them out at sea and escorted them into Harwich Harbour.

She is, however, so entirely different to our own ships, as to be of interest, and doubtless experience will be gained that will render the purchase worth the money.



A FEW SNAPSHOTS SECURED BY OUR PATROLLING AIRSHIPS 1. Torpedoed Spanish ship sinking 2. A schooner aground on the Manacles 3. A torpedoed steamer off East Fortune 4. A floating mine ashore near Capel 5. Wreckage of a torpedoed steamer 6 and 7. Torpedoed vessels being escorted to port.

THE AIRSHIP OLD COMRADES' ASSOCIATION

UNDER the above title an association has now been formed, in connection with and under the auspices of the Airship Officers' Club, whose address for the present is at 4, Dean Stanley Street, Westminster, where the Honorary Secretary will be pleased to receive any communications from those interested. The idea of the committee of the Airship Officers' Club in bringing this association into being, is to help ALL ranks, including officers and N.C.Os., both men and women. With this point in view, the primary objects of the association will be the formation of a Mutual Benefit Society and Headquarters for obtaining, without charge, employment both relating to airship construction and flying, as well as any other form of employment, and to that end a register will be kept up-to-date. To join up, only a nominal annual subscription of 2*s*. 6*d*. is payable. A feature of the association will be the organising by the Committee of "Old Comrades" dinners, meetings and other entertainments, thereby helping to keep the past and present airship men in touch with each other. In every way the very excellent objects of this "offspring" of the Airship Officers' Club have so commended themselves to the Editor of "FLIGHT," that arrangements have been concluded for official notices of the association as to meetings and other matters concerning the members to be published regularly in the pages of "FLIGHT." A point to be noted is, that the association is for the benefit of its members only and is to be kept entirely outside all political parties. Service questions is another subject which is also taboo. Altogether the conception of the association should be a valuable airship asset in keeping the threads together of what promises in the near future to be a vast undertaking and industry, whatever the difficulties which at the moment may appear to militate against progress. In fact the more clouds on the horizon of the airship future, the more the need for an association of this character.

Brig-Gen.. E. M. Maitland is the President of the club, the Committee for the first year comprising Lieut.-Col. F. Boothby, Maj. Roberts, Capt. J. H. Hagon, Capt. Montague, Capt. Bellew, Maj. A. Congreve, Capt. G. E. Stringer, and Maj. G. F. Herron, the Hon. Secretary. This committee will also act for the association.

For the guidance of those directly concerned the following are the official objects of, and regulations for guiding the carrying on of the new body :—

(1) The Airship Old Comrades' Association is intended for the benefit of officers, warrant officers, N.C.Os., men and women who have served in the Airship Service. This will include Government civilian staff, male and female, who have been employed at airship station and establishment.

Officers, men and women, now serving may become hon. members, and as such be able to enjoy the social benefits only.

(2). *Objects*.—The primary object of the association will be to form a mutual benefit society and to provide headquarters for obtaining employment in any way connected with airship construction or flying. It will also endeavour to assist members of the association to obtain any other form of employment, but will in no way be responsible should it fail to do so. The association will not make any charge, but it is hoped that anyone for whom work is found will make a donation to assist the association if he or she is able.

(3) *Subscription*.—The subscription shall be 2*s*. 6*d*., payable on joining and thereafter annually on July 1, payable to the Hon. Secretary, 4, Dean Stanley Street, S.W. 1. Any alteration in the annual subscription shall only take effect after confirmation at the annual general meeting.

(4) *List of Members*.—A book containing the names, addresses and trades of all members will be kept up-to-date and circulated annually free to all members and to hon. members on payment of 2*s*. 6*d*.

Register.—In addition an unemployment register will be kept, stating the trade qualifications of the members on the list from which employers of labour will be regularly circularised and kept informed.

(5) *Committee*.—The committee shall consist of eight members. For the first year the committee of the Airship Officers' Club will act. Thereafter the committee will be elected by ballot of the members (not hon. members) of the association. Any member willing to serve and who is proposed and seconded by two members shall be eligible to be balloted for. Ballot forms will be included in the book issued to members together with the list of members proposed for election. The form shall be returned to the Hon. Secretary within 14 days and the results published in one month. The new committee shall take over on July 1.

(6) *Powers of the Committee*.—The management and control of the property, funds and affairs of the association shall be vested in the committee.

(7) *Foreign*.—Members going abroad should advise the Secretary and may be asked to represent the interests of the association in various parts of the world. They should in any case inform the Secretary of any suitable vacancies they may know of and keep the association in touch with the local labour condition.

The association is already represented in the Malay States, Ceylon.

(8) *Social*.—The committee will also organise "old comrades" dinners, meetings, or any other entertainments at the request of the members, that the committee may think desirable (probably one for each station annually) which members and hon. members may attend on paying expenses.

The Editor of "FLIGHT" has kindly placed his journal at the disposal of the association for the notice of meetings, etc., and all official notices will be published in it.

The committee are responsible that the association keeps clear of all political parties and is used solely for the benefit of its members. It shall not interfere in Service questions in any way.

AVIATION IN PARLIAMENT

Airship Construction, Barrow-in-Furness

MR. T. WILSON, in the House of Commons on July 14, asked the Secretary of State for War whether he can indicate the policy of his Department in connection with the building of airships; whether he is aware that, owing to the change over from war to peace conditions, numbers of workpeople are unemployed in Barrow-in-Furness; and whether he can hold out any hope of expediting the construction of airships at Barrow-in-Furness, and thus facilitate the employment of the workpeople now unemployed, and who have in the past been employed on airship construction?

Dr. Macnamara: I have been asked to answer this question. As regards the first part, I am not quite sure what information it is that my hon. friend desires. As regards the second and third parts of the question, so far as we are concerned, Messrs. Vickers' airship shed is not large enough for the construction of rigid airships of the sizes now required by the Navy, and it is therefore impossible, under present conditions, to order further rigid airships for construction at Barrow-in-Furness.

Anti-Fire Devices

MR. RAPER, on July 17, asked the Under-Secretary of State to the Air Ministry whether his attention has been called to the destruction by fire of a British postal aeroplane in the South of France; and whether he is satisfied that all anti-fire devices are used on such machines?

Maj.-Genl. Seely: From the preliminary reports received by the Air Ministry it would appear that the aeroplane in question caught fire after "crashing." The provision of "self-sealing" petrol tanks is a great safeguard against fire in accidents of this kind, but the progress with this type of tank has been so recent that it has only been possible to fit them in the very latest design of aeroplane. All future designs will provide for "self-sealing" petrol tanks.

Amsterdam Exhibition

CAPT. W. BENN asked the Under-Secretary of State to the Air Ministry what steps the Controller of Civil Aviation is taking to assist commercial firms to show machines at the forthcoming exhibition at Amsterdam?

Maj.-Genl. Seely: Assistance is being given to private firms by the release of machines and engines, where they have passed the experimental stage, and can be spared from the Royal Air Force. Negotiations have been in progress with the Dutch Government for the opening of civil communication by air between England and Holland during the period of the exhibition.

Aerial Mails

IN his speech introducing the Post Office estimates in the House on July 17 the Postmaster-General said: The question of air mails is one which, naturally, has occupied our attention very much during the War. This has been placed entirely, and quite rightly, under the care of the Air Force. It does not do to have half a dozen people interfering with one thing. The results which have been achieved—I believe mainly privately—in flying the Atlantic have been very remarkable. The first attempt by Hawker, unfortunately, was not a complete success, but he managed to deliver a small number of letters which he was bringing, and they were quite safely delivered in London. I received a letter from the Postmaster-General of Newfoundland, to which I replied in suitable terms. The next attempt, by Capt. Alcock, was completely successful. He flew in 16 hours from Newfoundland to Ireland, and managed to deliver his mails in a very satisfactory condition and in a short time. What I consider to be one of the most remarkable achievements was that just accomplished by the R 34—the lighter-than-air ship—which went from here to America in an incredibly short time, made a round, and came back to this country again. I sent a letter to the Postmaster-General of Canada by the R 34, and a few hours after she arrived back in this country his reply was delivered to me at the General Post Office in London. Of course, these things do not make the question of air mails a practical proposition, but it has been shown that there are great possibilities. In the course of time, if the progress made is as rapid as has been made in the flying branch of the Army, before many years the long-distance post, at any rate, will be carried by either lighter or heavier-than-air machines.

Capt. W. Benn: What about internal mails by air in these islands?

Mr. Illingworth: At present the great difficulty is the state of the atmosphere. I am told there is great difficulty in navigating in a hazy atmosphere and also in landing. I am informed that when that is overcome it will be a practical proposition for the longer distances. I do not know what means are taken to fly and land in thick weather, but I gather that it will not be beyond the resources of the people of this country to do that.

FLIGHT

V.C. FOR THE LATE CAPT. MANNOCK

IT was announced in the *London Gazette* on July 18 that H.M. the King has been pleased to approve of the award of the Victoria Cross to the late Capt. (acting Maj.) Edward Mannock, D.S.O., M.C., 85th Squadron, R.A.F., in recognition of bravery of the first order in aerial combat.

On June 17, 1918, he attacked a Halberstadt machine near Armentières and destroyed it from a height of 8,000 ft.

On July 7, 1918, near Doulieu, he attacked and destroyed one Fokker (red-bodied) machine, which went vertically into the ground from a height of 1,500 ft. Shortly afterwards he ascended 1,000 ft. and attacked another Fokker biplane, firing 60 rounds into it, which produced an immediate spin, resulting, it is believed, in a crash.

On July 14, 1918, near Merville, he attacked and crashed a Fokker from 7,000 ft., and brought a two-seater down damaged.

On July 19, 1918, near Merville, he fired 80 rounds into an Albatros two-seater, which went to the ground in flames.

On July 20, 1918, east of La Bassee, he attacked and crashed an enemy two-seater from a height of 10,000 ft. About an hour afterwards he attacked at 8,000 ft. a Fokker biplane near Steenwercke, and drove it down out of control emitting smoke.

On July 22, 1918, near Armentières, he destroyed an enemy triplane from a height of 10,000 ft.

Maj. Mannock was awarded the following distinctions for his previous combats in the air in France and Flanders :—

Military Cross. (Gazetted September 17, 1917.)

Bar to Military Cross. (Gazetted October 18, 1917.)

Distinguished Service Order. (Gazetted September 16, 1918.)

Bar to Distinguished Service Order (1st). (Gazetted September 16, 1918.)

Bar to Distinguished Service Order (2nd). (Gazetted August 3, 1918.)

This highly distinguished officer during the whole of his career in the R.A.F. was an outstanding example of fearless courage, remarkable skill, devotion to duty, and self-sacrifice, which has never been surpassed. The total number of machines definitely accounted for by Maj. Mannock up to the date of his death in France, July 26, 1918, is 50—the total specified in the *Gazette* of August 3, 1918, was incorrectly given as 48, instead of 41.

AIR COMPETITIONS AT SOUTHPORT

THE hum of the Avro Air Fleet attracted a large crowd to the Birkdale Palace Aerodrome, near Southport, last Saturday. It is estimated that some 10,000 people witnessed the flying from the enclosures and the sandhills round the aerodrome ; in fact, it is stated that no such crowd had been seen at Southport since King Edward VII visited the city.

The occasion was Lancashire's first Aerial Fete and Gymkhana. Machines came from Morecambe, Manchester, Blackpool, Liverpool and Preston to compete in the events. Punctually at 3 o'clock the Avro Band, which had flown over from Manchester, struck up as two flights took the air and flew round Southport in formation, the first flight of five machines led by Capt. E. Maitland-Heriot, D.S.C., landing in formation, making a very pretty spectacle.

The next event, a landing competition, in a space of about 50 yards square, gave the spectators some idea of what a modern machine is capable. An imitation fence had been planted in the sand, and competitors had to land as near over it as possible. One or two pilots landed on the near side and demolished part of the hedge, which the officials and judges quickly repaired. This event was very exciting both for competitors and spectators, as two or three machines would land side by side within a few seconds of each other.

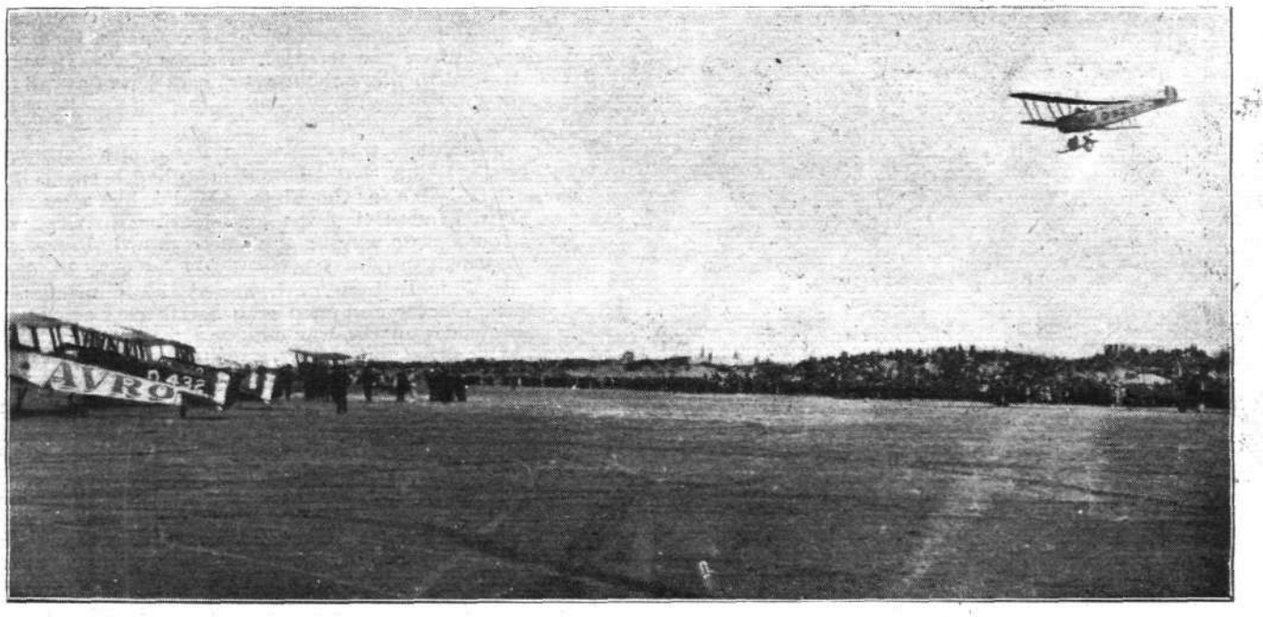
An aerobatic display followed, all the usual stunts being performed in order, so that the spectators had an opportunity of distinguishing between such manœuvres as a continuous vertical bank, a spiral and a spin.

The big event of the day was a 12-mile race over the sea and sand. This attracted 10 entries, all of whom got off within a few seconds of each other. Lieut. Brown led from start to finish, closely followed by Lieut. Adams and Capt. Heriot. It was surprising the difference in speed between the machines, in view of the fact that they were similar in all respects.

The "Follow-My-Leader Competition" concluded the display, a long string of machines imitating the leader's example in such manœuvres as diving, zooming, turning and landing.

A silver cup, value 30 guineas, presented by the directors of the Birkdale Palace Hydro, was awarded to Lieut. Brown for the best all-round performance of the day. Fitter Rigby and Fitter Gower, mechanics on the winning machine, were also presented with prizes. Lieut. Adams was judged second and Capt. Collison third in the day's performance.

Maj. Crossley, R.A.F., and Messrs. C. H. Parr and A. Whittaker, of Birkdale, officiated as judges. After the event 10 machines did passenger flying, and were kept very busy for several hours. The whole exhibition was organised by Maj. McMinnies, late R.A.F., who is running the Avro enterprise in the North of England.



The Avro "Aerodrome" on the sands at Southport for the flying meeting

AIRISMS FROM THE FOUR WINDS.

So at last those "Victory Medals" for all and sundry who have done their bit are to be forthcoming. It would have been in keeping that they should have been "out" in time for the Victory march last Saturday. But there are many disturbing causes which prevented such a consummation to the efforts of the International Committee appointed to decide upon the matter in principle and in detail. But it's something to have got going so far as to be able to set out the final conclusions arrived at by the Committee. "Victory Medal" is the official title decided upon. Each Power is to entrust the carrying out of the design to an artist of its own, but the following general principles will guide the artists :—

(*a*) On the obverse there will be a winged figure of Victory, full length in the middle of the medal, and full face; the borders and the background plain, without either inscription or date.

(*b*) On the reverse there will be an inscription "The Great War for Civilisation," translated into the different languages, and either the names of the different Allied and Associated Powers or their coats-of-arms.

(*c*) The rim is to be plain, and the medal is round (36 mm. in width) and made of bronze.

This medal will be distributed on principles to be decided by each Government, but in such a manner that it cannot be confused with a purely commemorative medal which might be given to all mobilised men.

The ribbon is identical for all the countries, and consists of two rainbows joined by the red in the centre.

"Flight" Copyright.

A striking group in the scheme of decoration in Oxford Street, outside Selfridge's, and undertaken by that firm. Note the R.A.F. figure in the centre of the group.

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IN regard to how the distribution to the troops throughout the British Empire should be governed, the obvious scheme of restricting it to troops who had been engaged in actual fighting at once presented itself to the Committee. But on referring the matter to experts at the War Office who had been engaged in former distributions of war medals it was found that, owing to the great depth of fire zone under modern conditions, the expressions "under fire" and "in the presence of the enemy" were very difficult to define with any degree of accuracy, and therefore, that even if any precise definitions could be made, it would take many years to examine and adjudicate the claims of so many million men. Even then this distribution would be unsatisfactory. It was, therefore, decided that all that was possible was to give a distinctive reward to those who had entered a theatre of War. As regards the Army, it was therefore, proposed to restrict the Victory Medal to those officers and men who had entered a theatre of War on the strength of any military unit

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THE problem as regards the Navy was somewhat different. Although there would not be the same difficulty as would be experienced when dealing with the Army in distinguishing between those who had been engaged in fighting and those who had not, yet it was considered that the definition "all officers and men who had been afloat on duty" would be analogous to the definition applied to military personnel, viz., "all officers and men who had entered a theatre of War on duty and on the strength of any unit." It was, therefore, decided to adopt the former condition of award for naval personnel.

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IF this analogy was carried on to the Air Force, it would necessarily follow that all those who had been up in the air would be eligible for the Victory Medal, but after consideration it was found that the qualifications in the Army and Navy could in no way be applied to the Air Force, and that distinct conditions of service would have to be drawn up. The Air Council therefore proposed the following :—

(1) All officers and men who had been posted to a unit in any theatre of the war outside Great Britain.

(2) All officers and men of operational units in Great Britain who have been actively engaged in the air against the enemy.

(3) All officers and men employed on flying new aircraft to France.

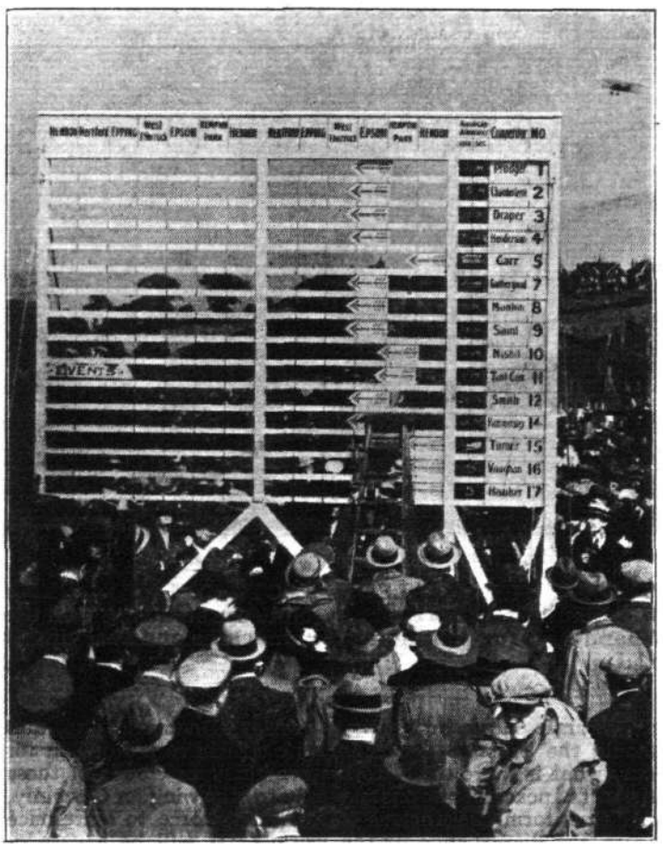
(4) All officers and men who have formed part of the complement of aircraft-carrying ships.

The operational units include those employed on the following duties :—

(*a*) Airships employed on Fleet reconnaissance, convoy work, and anti-submarine patrols.

(*b*) Aeroplanes and seaplanes employed on coast reconnaissance and anti-submarine patrols.

(*c*) Aeroplanes and seaplanes employed to protect Great Britain from hostile air raids.



"Flight" Copyright.

A nearer view of the very practical "scoring-board" which was used for the first time at Hendon for the Aerial Derby. We publish this by request, as it should be a feature at any race meeting to enable the public to follow closely the positions from time to time of the competitors. It is to be a regular feature at the London Aerodrome, Hendon, and should add considerably to the popularity of this great open-air London resort

THE British War Medal will be given to all officers and men who have left their native shores in any part of the British Empire, whether they eventually entered a theatre of war or not. Men who left the United Kingdom to garrison any part of the British Empire, and equally men from the Dominions who came to this country, but did not later go to France, will therefore be entitled to this medal.

A general desire was expressed to have a separate medal for each theatre of war, but on enquiry it was found that there were several hundred thousand men who had served in more than one theatre of war. As many as 150,000 had even served in four. As it would obviously be unjust to give these men four medals, while the greater portion of the Army serving in France would only receive one, it was decided to abandon the idea of separate medals for each theatre of war.

IT was first considered that, owing to the kaleidoscopic nature of the War and the protracted periods and extensive areas covered by the battles, it would be impossible to award "battle" clasps. It was thought that the examination of different claims would be such a vast undertaking that the issue of clasps would not be possible for many years. It was therefore decided to award "date" clasps only.

A very strong desire was, however, expressed that "battle" clasps should be awarded. It was represented that there was not the same urgency with regard to the issue of clasps as there was with regard to the issue of medals, and that the British soldier would prefer "battle" clasps, even though their issue would be protracted, than none at all. The matter was therefore reconsidered, and a special committee, composed of representatives of all three Services—the Navy, the Army, and Air Force—and each of the Dominions, has been appointed to report on whether battle clasps are possible, and, if so, to decide what "battle" clasps should be awarded.

WOMEN borne on the strength of an organised Force will, if they have entered a theatre of war on duty, be entitled to both the British and Allies Medal, but women belonging to any independent organisation recognised by the Admiralty, War Office, or Air Ministry in any theatre of war will receive the British Medal only.

As regards precedence, it has been decided that these medals and stars shall rank in the following order:—

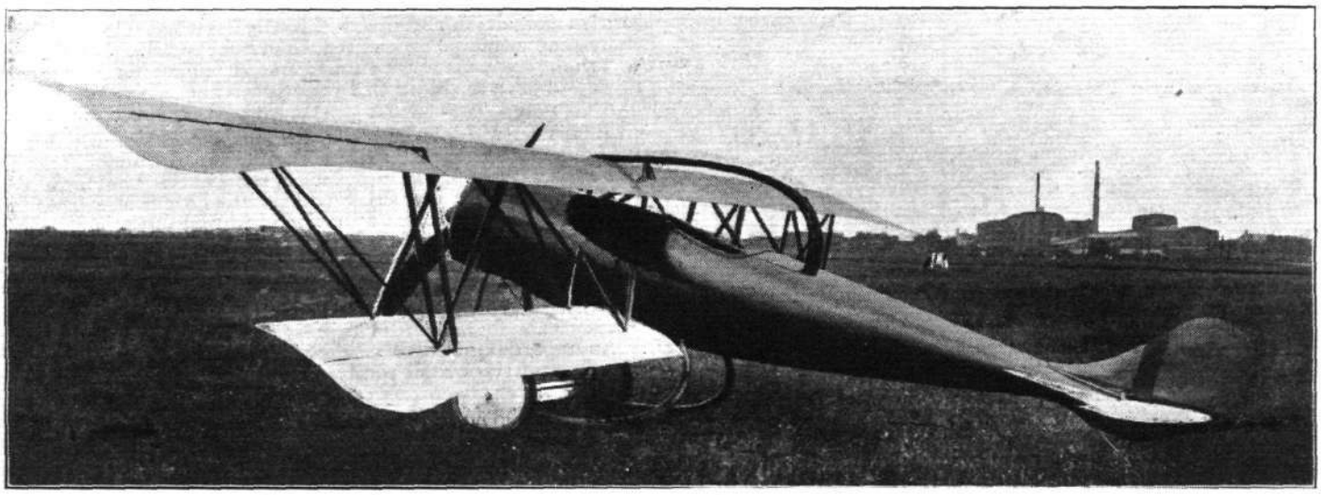
The 1914 Star.
The 1914-15 Star.
The British War Medal.
The Mercantile Marine War Medal.
The Victory Medal.

The British War Medal will be made of silver, but all the others in bronze. The design for the British War Medal has been the subject of an open competition among artists, and the best artists in this competition have now been asked to design the Victory Medal for the troops of the British Empire.

IN Federal official circles in Melbourne it is freely stated that a minimum of £300,000 is to be expended during the present financial year on constructional aviation work. Compared with the amount set aside Imperially by our Home Parliament, the amount is generous.

PROVISIONALLY, flying in Denmark with passengers has

PEACE DAY ON EARTH.—SMITH (*ex-Lieut. Smith, R.A.F., a very small man, finds himself firmly wedged in the crowd on Peace Day*): **"Jove! I'd give a thousand pounds to be in my old Camel just now."**



THE DIMINUTIVE BIPLANE RECENTLY CONSTRUCTED AT THE PAALSON FACTORY IN SWEDEN: It weighs 700 lb., and carries 400 lbs. at 80 m.p.h. with a 50 h.p. Thulin-Gnome engine. Note the strutting and the peculiar "gadget" above the body—presumably a sort of hand-grip for picking up the machine and carrying it home!

been forbidden, and foreign pilots desiring to fly to Denmark must first obtain official permission.

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FROM Copenhagen comes information in regard to the plans of a German aerial company for obtaining the leading position in Scandinavia, as opposed to British and French enterprise. It is boldly stated by the Berlin correspondent of the *Ekstrabladet* that this company is at work on a big scheme to establish a regular airship line between Berlin, Odense, Copenhagen, and Stockholm. Trial flights have recently been made with a giant Zeppelin, intended for the new route, which is driven by seven powerful motors and able to carry 100 passengers besides its crew. The trials have proved satisfactory, and, if all goes well, the line will presumably be opened in two or three weeks. What we do not, however, quite follow is how this activity can be reconciled with the terms in the Peace Treaty whereby Germany is debarred from building or possessing aircraft.

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THERE is, of course, a natural sequence to a clause of this sweeping character. What is to prevent the Huns running big aircraft shows in Norway, Sweden, Denmark, etc., and should the Prussian junker in time still have a stomach for war, what is more likely to happen than for clouds of these aircraft of peaceful nations suddenly to take wing for Germany, and thus form the nucleus of a fighting force to start once again the disturbance of the world? It will be a case of Der Wacht on the members of the League of Nations!

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Apropos this L. of N., with Victory Day over and the millennium of the L. of N. arrived, it is quaint to note that Roumania has now started a general mobilisation for combating the dangers anticipated from Hungary, even young students of aviation in France having been commanded to return immediately, with or without pilots' certificates. As a famous conjurer used to say "Isn't it wonderful?"

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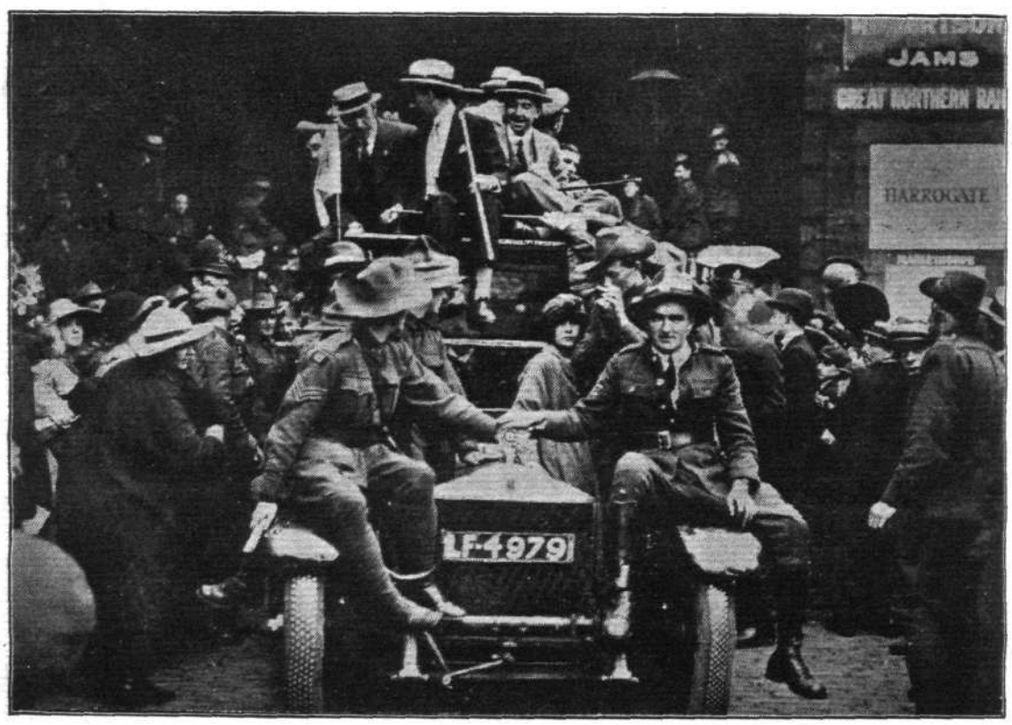
AND how does this L. of N. stand in regard to roping in with its tentacles, the handling of the "Direct Action" Bolshie Johnnies who are just now out so strenuously to help forward the peace of the world?



When the "bhoys" would not be denied: Col. Warwick-Wright's Rolls-Royce full-up, inside and out. This car, upon the occasion of the photograph (the home-coming of Hawker after his Atlantic attempt), accommodated no less than 37 passengers, in the procession to the Royal Aero Club—10 inside, 11 on the roof, 4 standing on the petrol tank, 4 on the driver's seat, and 2 on the bonnet, the balance being distributed on the running boards and mudguards. It was rough on the springs, but the engine never made a murmur.

FLIGHT

SOME DEVELOPMENTS IN AIRCRAFT DESIGN AND APPLICATION DURING THE WAR

By the Right Hon. LORD WEIR OF EASTWOOD, P.C., Honorary Fellow of the N.E. Coast Institution of Engineers and Shipbuilders.

(*Continued from page* 959)

PART II.—*Construction and Application*

Wing Structure.—General development in wing construction of aeroplanes, during the War, has been more in the nature of refinement of detail, than of evolution of methods.

With increased knowledge concerning the loads to which the structure is subjected during flight, has come the possibility of more scientific proportioning of the structural members; but beyond this the general arrangement of the wing has remained unchanged The structure percentage weight has shown the effect of increased knowledge, and this percentage has now reached a very low value.

The effect of attention to detail has also been to give a general cleaning up and simplicity to the appearance.

In external bracing, changes have taken place in some particulars. In 1914 the duplication of the main lift wires was considered to be very important, if not essential; now, in the event of one wire getting shot away, the loads are taken through the incidence wires, which are those seen when looking at a wing from the side. At the commencement of the War, hard-drawn piano wire was used for the main lift and anti-flying wires in many types; when this was not used, stranded cable was employed. The use of these materials has been superseded by streamline wires. These consist of high tensile steel rods of a lenticular section rolled from bar. The ends are left circular, and threaded to form a simple means of attachment to the fittings. These wires have proved very satisfactory, and initial troubles, due to crystallisation of the metal through vibration, having been overcome, this is now the commonest form of bracing. Hard-drawn piano wire has disappeared, but cable is still extensively used, par icularly in types where high performance is not essential.

Tthe design of interplane struts has undergone certain changes. The earlier aeroplanes had struts of streamline section made from solid spruce, and occasionally steel tubes faired off to a steamline form by light fairings were used. With the growth in size of aeroplanes and the increasing scarcity of suitable wood, built up or laminated struts were used. Also, with the standardisation of steel tubes for aeroplane work, and an enormously increased production of these, this form of strut became very popular. It is a most efficient construction, particularly for the landing chassis.

Internal bracing wires have gone through much the same process as the main-plane bracing wires—at the commencement of the War, piano wires were invariably used, but these have now almost universally been superseded by swaged rods, screwed at the ends for fitting purposes.

During the War also, the scarcity of silver spruce occasioned the development of new methods of spar construction. These were originally always in one length from the centre section to the wing tip and spindled from a solid section. The first effect of timber shortage was to introduce a system of splicing, and much experimental work was carried out to determine the best form of splice to be used. The result of this work was that a straight scarf joint sloped 1 in 9 was adopted as a standard. This scarf was glued, pegged and wrapped with fabric. Its efficiency was high when compared with the solid spar, and it was a simple job when considered from a production point of view.

The splicing of spars was not found sufficient to overcome the timber shortage, and the need became evident for some change in design by which small scantling timber could be used, even for the spars of large aeroplanes.

Further experimental work was put in hand, this time to determine the effect of laminating spars, *i.e.*, glueing thin strips together, and from this built-up section constructing spars in the ordinary way. At the same time experiments were made on box spars, *i.e.*, the spars instead of being made of the common "I" section were made in box form, the flanges and webs being formed of separate pieces of materials, glued and bradded together. Both the laminated and box spars were found to be very successful, and both types were immediately put into service. No trouble has been met with from their use. Indeed, it is probable that better quality spars are obtained by this means than by cutting from the solid, at any rate for large aeroplanes. The smaller the scantlings, the easier inspection becomes, and the more guarantee is there that first-class material only is being used.

Splicing and the building up of spars have proved such successful innovations, that there is no doubt that these methods of spar construction, introduced purely as War measures to overcome the serious timber shortage, will remain as standard in the future.

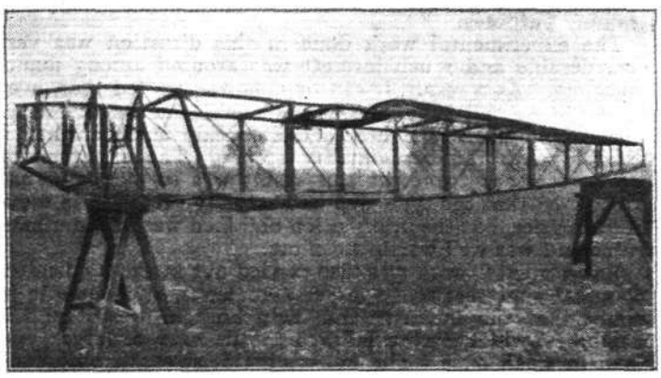


Fig. 8.—Braced N-girder *fuselage*. Fairey.

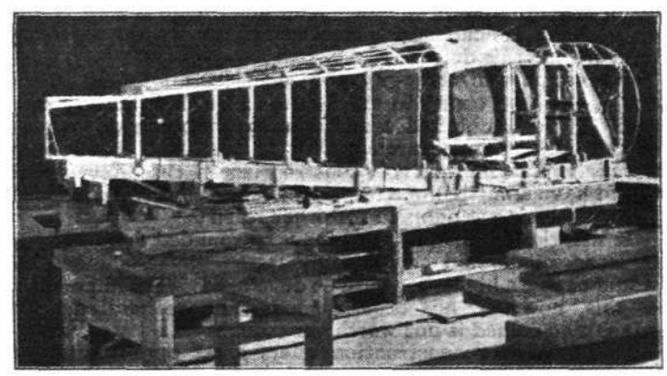


Fig. 8a.—Braced N-girder *fuselage*. Camel.

Fuselage Construction.—Fuselage construction has undergone very few changes, during the period of the War, as regards methods. Larger aeroplanes have been built, and this has naturally meant greater attention to the construction, but the broad lines of design have remained fairly well the same.

There are three principal types of construction adopted in present-day practice:—

1. The braced N-girder *fuselage* (Figs. 8 and 8A).
2. The three-ply covered *fuselage* (Fig. 9).
3. The monocoque *fuselage* (Fig. 10).

The first of these consists of four *longerons*, or fore and aft rails, braced by a system of struts and diagonal wires in all four faces. Fabric covering completes the structure. This is the commonest type of design.

The second system retains the *longerons* and the vertical and horizontal struts, but in place of bracing wires and fabric, thin three-ply is glued and bradded to the framework.

The *monocoque fuselage* dispenses with the *longerons* and consists of a single sheet of three-ply or veneer moulded to shape on formers.

As a general rule, three-ply frames are provided as bulkhead bracing at intervals along the length. There are several varieties of this construction, but the essence of them all is the tubular construction of thin veneer, the formers or bulkheads merely being inserted to stabilise this skin.

Of the three methods of construction, the first and third were known and adopted before the War, and modifications have been more in the nature of improvements in manufacture than in fundamental alterations in principle. The second method was, I believe, first used by the Germans in their early Albatross scout at the beginning of the War,

but has since been used with great success by British designers, notably in the case of the De Havilland designs.

Monocoque Construction.—The *monocoque* method of construction was adopted by the Germans at an early date and was later almost universally used by them. The probable reason for this was their ample supply of high-grade three-ply, rather than any constructional or aerodynamical advantages which they attached to this method of construction.

The chief advantage, from the service point of view, of a *monocoque* method of building *fuselages* lies in its invulnerability to casual bullets. In an ordinary *fuselage* a bullet striking a main *longeron* or strut might quite possibly cause

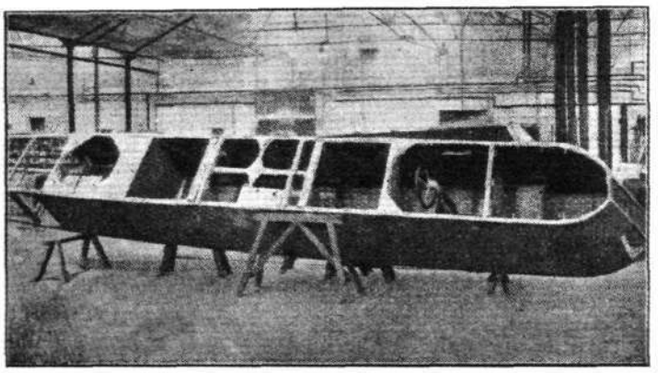


Fig. 9.—Three-ply covered *fuselage*. De Havilland 10.

the structure to collapse, whereas a *monocoque* will stand up to any number of bullets. A disadvantage is that truing up becomes difficult and special arrangements are necessary to overcome this defect.

Our supplies of three-ply were deficient almost up to the end of the War owing to the failure of the Russian supplies, and this no doubt had a considerable influence on our designers and manufacturers. One of our firms did develop a very simple method of constructing in three-ply, which would have admitted of a large production, but the particular aeroplane was not adopted for other reasons.

It was thought at one time that the rounded fish-like form of *monocoque* would considerably lessen air resistance, and would enable a higher speed to be developed. The importance of this, however, has been a good deal exaggerated; the advantage gained is not worth very much.

The *monocoque* construction offers great opportunities of development for commercial aeroplanes, as it leaves the space inside the skin free from obstruction, a very considerable advantage when carrying mails, goods or passengers, and in this respect it has a great pull over the standard braced *fuselage* where diagonal bulkhead bracing wires occur at every panel. It has also a considerable advantage in the almost complete absence of metal fittings, making for ease of construction.

The largest aeroplane yet built—the Tarrant Tabor—has a *fuselage* 11 ft. in diameter, which has been built on a modification of this principle, the skin being made of layers of thin laths glued and tacked over formers until set. The skin is stabilised by latticed hoops of wood, and the resulting structure is a very light and strong *fuselage* with the whole of its interior free from obstruction.

The regrettable accident to this machine on its first trial in no way reflects on the basis design of the machine.

In a flying-boat, the hull has to function both as a boat, as a landing carriage, and as a *fuselage*, and it is not uncommon to hear of the seaplane, as a class, being under serious disadvantage to the aeroplane, because of the heaviness of its hull. Our experience during the War has brought us to the point of being able to state that a well-designed hull is no heavier than a *fuselage* and landing-carriage, and that sea aircraft are, therefore, under no disadvantage under this heading as compared with land aircraft.

Metal Construction.—There is no doubt that the future of metal construction for aircraft is very promising. The amount of work and time entailed in designing metal structures is very much greater than that required for wooden ones, owing to the experimental work involved. There is also the difficulty of introducing modifications during the production stage, modifications which were continuous, during the War, owing to Service demands to meet new and unexpected conditions. During the War, therefore, metal construction has not been generally adopted. Its future, however, was clearly seen, and a great deal of experimental work was done, principally in connection with the Avro Training aeroplane. At the end of 1917, as I have said before, there was a shortage of good quality timber, and a still greater shortage was foreseen as probable in the future, owing to the demands of the enlarged programme. A big effort was made to employ metal for the Avro which was absorbing something like one-third of our total wood supplies, and which was a

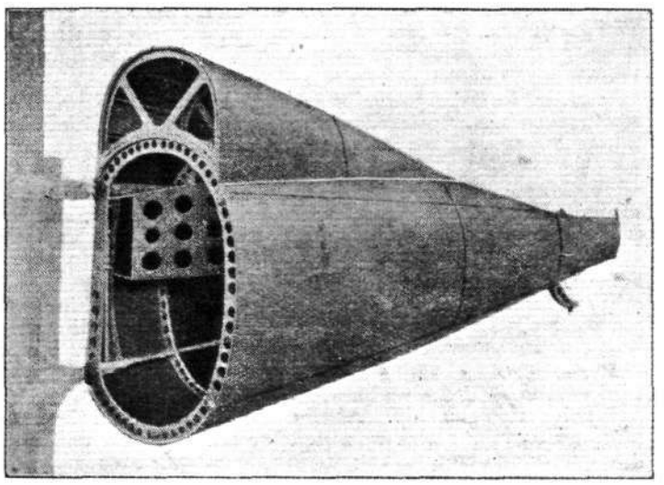


Fig. 10.—Typical *monocoque fuselage*. Parnall Panther.

thoroughly well established type, with an assured future for training purposes.

The experimental work done in this direction was very considerable and much interest was aroused among manufacturers. As a result, it can be definitely stated that, even for such a small type, the use of metal enables the wings to be made slightly lighter and distinctly stronger than is possible with the best quality spruce. The experimental work necessary to get at this result was so extensive and protracted that the type was not actually produced in metal in quantities, but the information obtained was of the utmost value and was well worth the effort.

Experimental work was also carried out in the application of metal construction to larger aeroplanes, and there is no doubt that the constructional gain both in weight and in reliability will be more marked in the case of large types than in small ones. The uniformity of strength obtainable in metal will give it a marked advantage over wood, and will

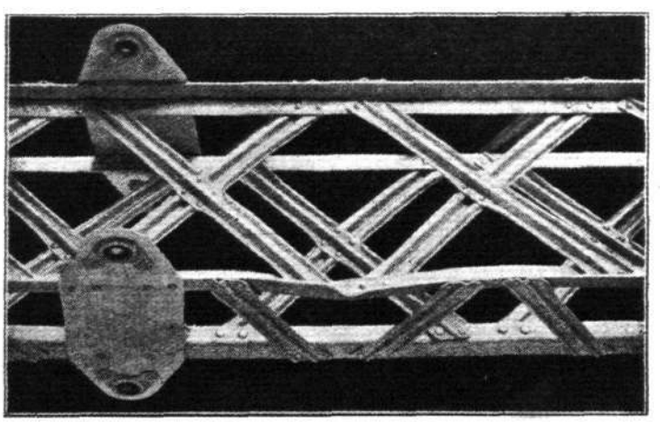


Fig. 11.—Metal construction. Vickers duralumin.

enable aeroplanes to be made without such large allowances for variations of material.

The Germans, on the other hand, were driven to the necessity of employing metal at an earlier date than ourselves, and although they never turned out any metal structure which would have satisfied us, this form of construction was very considerably employed. Their A.E.G. twin-engine bomber was almost entirely made of metal, but it was relatively heavy and allowed only a very small weight of bombs or fuel, before it became dangerously overloaded. For the spars they used high tensile steel tubes which are not altogether satisfactory for use as a combined strut and beam.

At the end of the War there certainly did appear an all-metal German aeroplane which was called the Junker monoplane. This was of a quite novel type of construction, the wings being covered with corrugated aluminium sheeting and having multitudinous internal tubular bracing. A very thick wing section was employed. The performance was not good, and it is doubtful if the type would have really been of any serious value, but as a piece of construction it showed considerable merit.

The Progress of Design and Construction of Propellers.—The screw propeller has for many years been used as an organ of propulsion for marine craft. It was not, therefore, a totally new problem with the advent of aircraft. In its use on aircraft the propeller altered its shape, and the blades became longer and narrower as compared with marine practice.

At the outset trial and error methods were applied, and a suitable propeller was arrived at only after the trial of a large number of designs. The variations met with in aircraft work are very great. At the present day, aircraft speeds vary from 40 m.p.h. in the airship to 150 m.p.h. in the aeroplane. The engines vary from 40 h.p. to 600 h.p., while the propeller revolutions vary from 500 to 2,200 per minute. With such

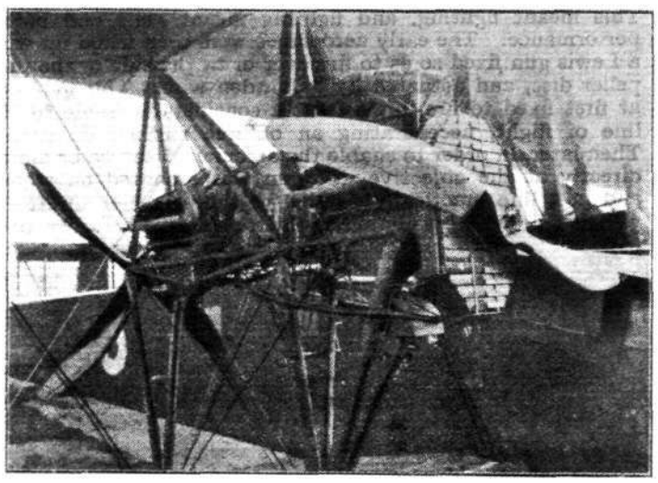


Fig. 12.—Tandem propellers. Handley Page V. 1500.

wide variations in conditions a surer and quicker method of arriving at the best results was demanded. Curiously enough, aircraft propeller designers had recourse to a method devised by M. Drezweichi in 1882 for the design of marine propellers, which consisted of a mathematical analysis treating the propeller blade as a rotating wing. The method was tested at the National Physical Laboratory, and is now in general use, with the result that it is rarely necessary to test more than two propellers to arrive at the desired result. Frequently the result is obtained with sufficient accuracy in the first trial design.

The efficiencies now obtained, in aircraft propellers are high, being 75 per cent. as an average, and frequently 85 per cent. under optimum conditions.

As regards construction the peculiar vibration and variation or torque prevented the use of metal, which quickly fatigued and failed. For this reason and also for quickness in manufacture, wood became and still is the principal material used.

Only the highest class material was suitable, for, at the speed at which modern aircraft engines run, the radial pull at the root of a propeller blade may be as much as 5 tons, while at the same time the propeller has to pull the aircraft along, involving bending moment due to forces of as much as $\frac{1}{2}$ ton per blade. The stresses due to these combined forces were satisfactorily met with for the smaller powers, but at one time it was thought that the size of engines would be limited by the maximum power which could be transmitted through a single propeller. And such might have been the case, had it not been discovered that instead of the stresses due to these two forces adding to each other, it might be arranged so that the bending stresses due to centrifugal action would completely neutralise those due to the thrust.

The only limits now imposed on propeller design are :—

1. Tip speed.
2. Constructional limitations.

As regards the first, experiments have shown that a tip speed equal to the speed of sound should not be exceeded, and to this speed we are rapidly approaching. In the standard propeller for the American Liberty engine in the D.H.9A, the tip speed is 880 ft. per sec. as compared with 1,050 ft. per sec. for sound. This difficulty, however, is met by gearing the engine so as to reduce the propeller speed. Provided the engine is suitably geared so that the tip speed does not exceed 900 ft. per sec., there appears to be practically no limit to the amount of power which can be transmitted through a single propeller. Even with present-day methods of construction it is safe to say that 2,000 h.p. can be transmitted through a propeller mounted on an aircraft flying at 80 m.p.h. and as much as 6,000 h.p. on an aircraft flying at 140 m.p.h.

As regards the question of commercial construction, development has been along normal lines; improvements have been made in the details of manufacture such as the glueing of the numerous wood laminations, and the protection of the blade with fabric and metal edgings; and the general result has been a better and more reliable article. Nevertheless, the use of wood is not wholly satisfactory, especially for future commercial work, involving flight through tropical countries, and we, therefore, look forward to the solution of the problem of the metal construction of propellers.

Division into Types.—When the War began the only aeroplane function which was considered seriously by the Army Authorities was that of reconnaissance, and there is no doubt that the B.E. 2A, which was developed by the Royal Aircraft Factory for this function, was an excellent aeroplane, thoroughly well adapted for its work.

Reconnaissance Aeroplanes.—These early aeroplanes were not intended to carry any military load other than crew, but almost from the very start of the War the military load required began to increase, with the result that all through 1915 and well into 1916 our reconnaissance aeroplanes were over-loaded with all kinds of equipment, such as guns, gun-mountings, cameras, wireless apparatus, etc., which were attached to any available part internally or externally. In order to carry out their requisite functions, this additional equipment was necessary, but it naturally meant a very considerable reduction in performance. The speed was brought down 10 or 15 miles an hour, while the extra weight and resistance had a very serious effect on the rate of climb.

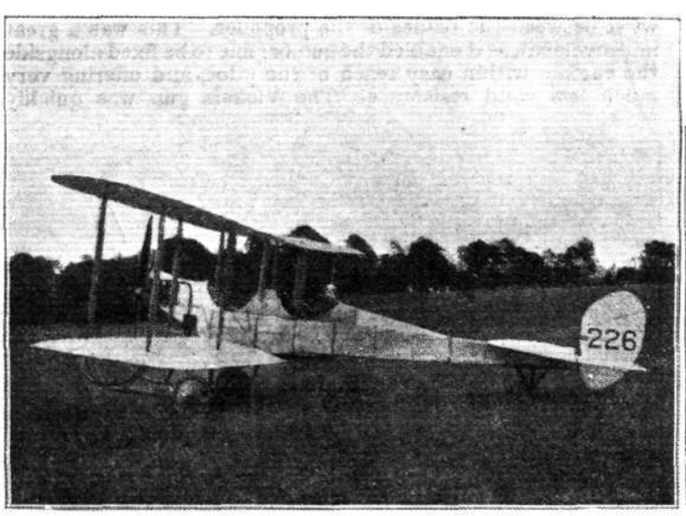


Fig. 13.—B.E. 2a.

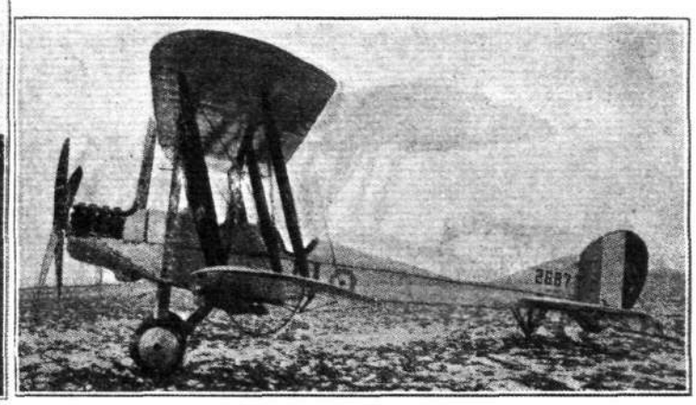


Fig. 14.—Reconnaissance machine. B.E. 2c.

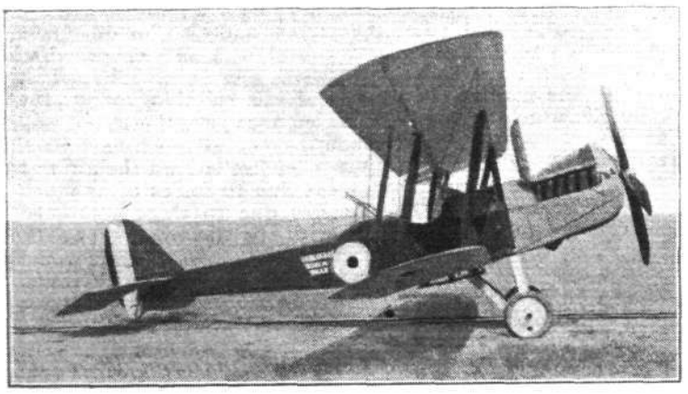


Fig. 15.—Reconnaissance machine. R.E. 8.

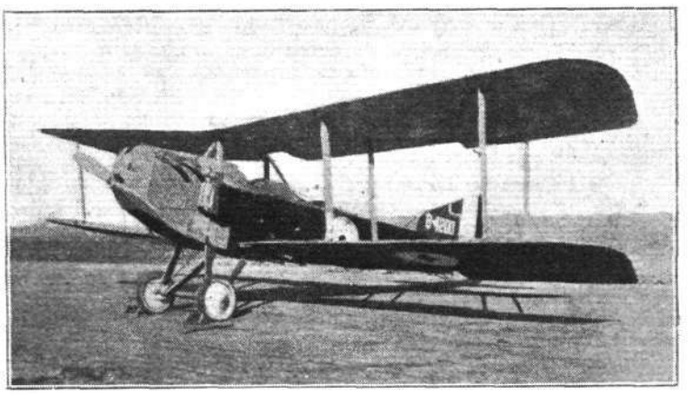


Fig. 16.—Artillery machine. Armstrong-Whitworth F.K. 8.

This is shown by the diagrams giving the performances at the different periods of the War; it is not until the latter part of 1916 that any appreciable improvement in performance can be seen, and then both the speed and the climb go up rapidly.

It was at this period that the special military aeroplanes, designed subsequently to August, 1914, first came into use, and in these full allowance was made for all equipment to be carried. The increase in performance was due not only to the higher power engines used, but also to the fact that the aeroplanes were designed to carry the equipment as far as possible internally, thus avoiding all unnecessary resistance.

As aerial tactics developed, the *rôles* of the pilot and observer altered, and the latter practically confined himself to being a pair of eyes in the back of the pilot's head, whereas the pilot had to do all the reconnaissance, artillery spotting, etc., as well as fly the aeroplane.

Single-seater Fighter Development.—As well as doing one's own scouting, it was necessary to stop the other side doing his, or rather to stop him from taking his reports home. This meant fighting, and fighting meant guns and better performance. The early aeroplanes were soon fitted up with a Lewis gun fixed so as to fire over or at the side of the propeller disc, and actuated by a Bowden wire. This gun was at first fixed to fire upwards at a considerable angle to the line of flight, necessitating an oblique method of attack. Then later, in order to enable the aeroplane itself to be aimed directly at the objective, the gun was mounted on stands and in a line practically parallel to the propeller shaft. It was found that, by aiming the aeroplane itself rather than an independent gun, shooting was more accurate. The attachment of all this gear and weight to machines which were not designed for them was a very serious handicap, and performances were reduced 15 or 20 per cent. on speed and ceiling.

Late in 1915 the Germans brought out a system of synchronising the trigger with the engine, so that the bullets went between the blades of the propeller. This was a great improvement, as it enabled the gun or guns to be fixed alongside the engine, within easy reach of the pilot, and offering very much less wind resistance. The Vickers gun was quickly

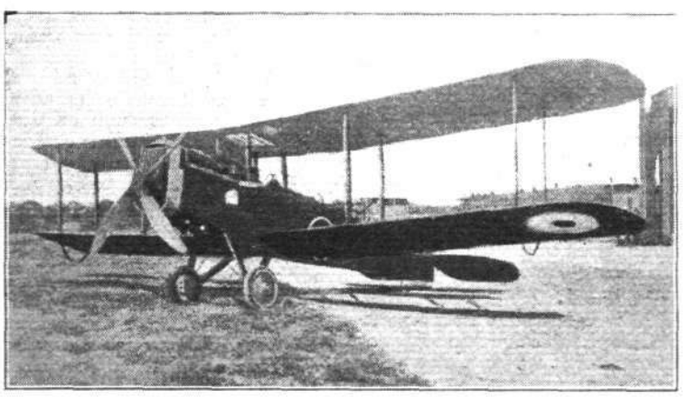


Fig. 17.—Artillery machine. De Havilland 4; Eagle VIII.

Fig. 18.—One-seater fighter. Bristol Scout.

Fig. 19.—One-seater fighter. De Havilland 2.

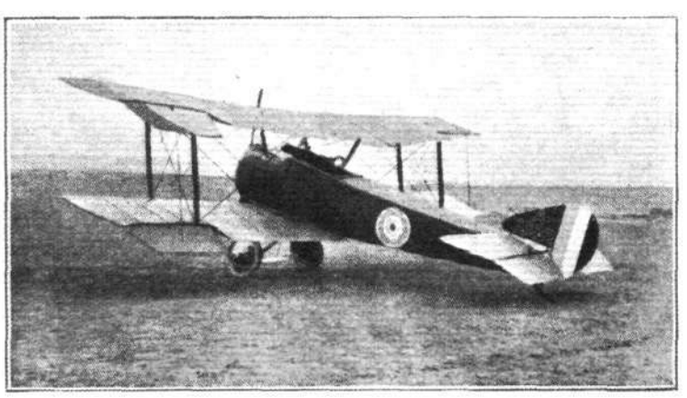


Fig. 20.—One-seater fighter. Sopwith Pup.

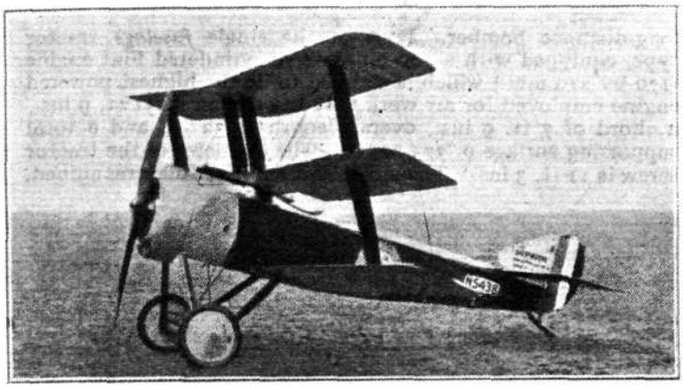


Fig. 21.—One-seater fighter. Sopwith triplane.

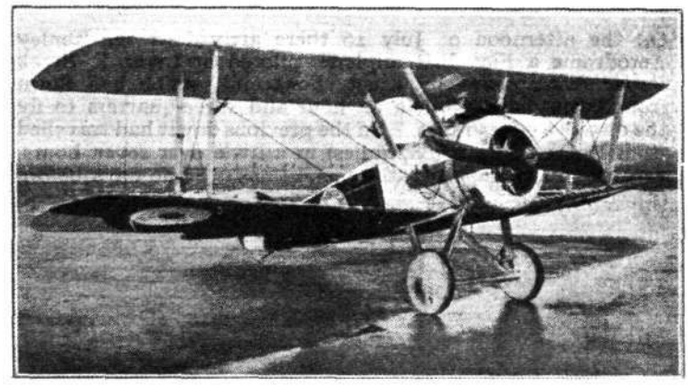


Fig. 22.—One-seater fighter. Sopwith Camel.

adapted to work in a similar manner on our Tractors, and by the late summer of 1916 our single-seated fighters were on a par with the Germans'. During this period, in addition to the Tractors with exposed Lewis guns, we had been making very considerable use of small single-seated pushers of remarkably good performance considering the difficulties of the proposition.

The characteristics of the Sopwith Pup, our first good tractor single-seater, were very light surface loading, a small but good rotary 80 h.p. French engine, and every scrap of unnecessary weight eliminated by careful design. The view, particularly overhead, was not very good, but the aeroplane was so handy fore and aft that this did not interfere very seriously with its fighting qualities. This type lasted a very considerable time before it was superseded, which, in view of the comparatively small horse-power, was remarkable. During the period in which this type was in use fighting acrobatics advanced to a marked degree, and in the next type an effort was made to increase view and manœuvrability. This was the Sopwith triplane with another French engine of 110-130 h.p., and its characteristics can be clearly seen in Fig. 21.

The loading per square foot had increased, but the loading per horse-power had decreased considerably, and the performance was better. Some of the aerodynamic disabilities of the triplane were overcome by the pronounced forward stagger and the use of a single strut. This single strut system increased the difficulties of manufacture and repair, particularly as regards trueing up. Both this aeroplane and the one before it were provided with only one synchronising gun, and the rate of fire was consequently slow.

In aerial fighting, the time in which it is possible to hold the enemy on the sights is very short, and one gun was found insufficient, apart from the considerable chance that the one gun might jam at the crucial moment.

In the next type, which was in design at the end of 1916, and came into production in 1917, we see the influence of these considerations upon the mind of the designer, who by the way was Mr. Hawker of Transatlantic fame. We have here a very simple and, though unstable, an easily controllable biplane with two guns. Enormous numbers of this type were produced in the course of the next year or two with French and English engines which increased in power up to 150 h.p. The type was nicknamed the "Camel" because of the curious hump in the *fuselage*.

(To be continued.)

COMMERCIAL AVIATION IN GERMANY

IN spite of the disturbed internal conditions in Germany, a determined attempt is being made to establish aviation on a permanent commercial basis.

From reports recently received it appears that a fairly large number of passenger services have been running for some time, mostly radiating from Berlin. Routes from the capital are in operation in Weimar, Frankfurt, Leipzig, Warnemunde, Hanover, Westphalia, Hamburg and Breslau. There are also services between Weimar and Frankfurt, Hamburg and Warnemunde, Leipzig and Weimar, and Hanover and Westphalia.

The Berlin-Weimar route opened as early as February 5. The results for the period up to the end of the month showed that 120 flights took place, of which all but 18 were successfully terminated. There were no accidents. The Berlin-Hamburg route was opened on March 1, and on this service also the results were considered satisfactory. In spite of bad weather and interruptions owing to trouble in Berlin a total of 108 flights, *i.e.*, three to four per day, were accomplished, and a total load of no less than 3,737 kilogrammes were carried. The average duration of each journey was 2 hrs. 11 mins., with a record trip of 1 hr. 15 mins. This and other services were utilised for the carriage of mails, and on this route only 6·1 per cent. failed to get through owing to bad weather, and had to complete the journey by train.

All these services are operated by the Deutsche Luft Rederie, a combine of various German aeronautical firms.

Return tickets are issued and are valid for a period of 30 days. Flying kit and motor transport to and from the aerodrome are provided, and are covered by an inclusive charge, of which the following are representative :—Berlin-Hamburg : single, 450 marks ; return, 700 marks. Berlin-Breslau : single, 500 marks ; return, 750 marks. Berlin-Weimar : single, 450 marks. Serial tickets available for 10 flights on any of the routes operated by the combine are issued at 3,600 marks. These tickets are transferable, and work out at an average reduction of 20 per cent. Luggage is carried free of charge, but the total weight of passenger—who is carried at his own risk—and baggage combined must not exceed a certain limit. Mails and parcels are also carried by the company, which is working in conjunction with the Hamburg-Amerika line, through whose offices bookings may be effected.

Apparently the railway troubles have reacted favourably on aerial transport, and a considerable increase of traffic has been caused. On the Berlin-Weimar route, which appears the most popular, the number of flights from February to the end of April was 538, while between Hamburg and Berlin from March 1 to the end of April there were 262 flights.

It is also of interest to note that a further fusion of interests of the various already existing commercial aviation companies is being organised under the direction of the Sablatnig Aircraft Factory and the Luftfah G.m.b.h.

Sir John Alcock at Manchester

SIR JOHN ALCOCK and Sir Arthur Whitten Brown visited Manchester on July 17 as guests of the Manchester Corporation. They were met at the Alexandra Park Aerodrome by the Lord Mayor and other members of the reception committee, and drove in an open carriage through crowds of cheering people along a 5 miles route to the town hall, where they were presented with gold medals, the gift of the city, in recognition of their Atlantic flight.

The N.E.R. Strike and Air Travel

THE strike on the North-Eastern Railway led to a sudden increase in the demand for aerial trips up North. One aeroplane left Leeds with two passengers and luggage for Scarborough, the fare per passenger being £7 10s.

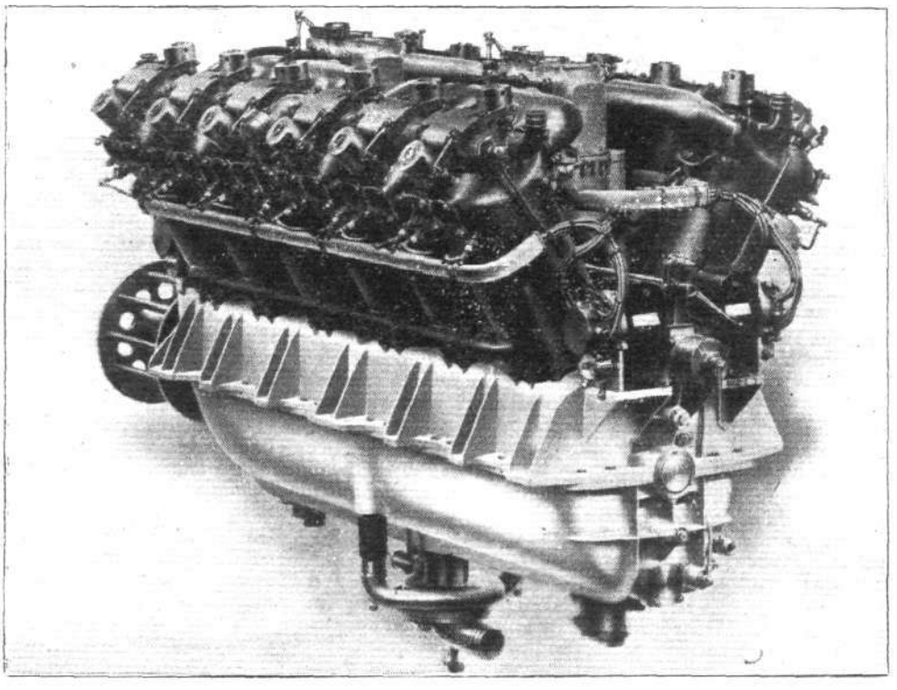
FLYING FROM TURIN TO LONDON

ON the afternoon of July 16 there arrived at the Kenley Aerodrome a Fiat B.R. biplane, piloted by Lieut. F. Brack Papa, accompanied by Lieut. Bonaccini, which had flown from Paris, having taken an hour and three-quarters to fly the distance of 225 miles. On the previous day it had travelled from Rome to Paris (687 miles) in a little over seven hours, despite unfavourable weather conditions. Some days before the machine had been flown from Turin to Rome, doing the 362 miles in 2 hours 15 mins. an average speed of 161 miles an hour. This beat the record for this journey, the previous best having been 2 hours 50 mins., made by Sergt. Stoppani on a Sia machine.

The B.R. Fiat biplane was designed by Engineer Rosatelli just before the close of the War, to be used as a high-speed long-distance bomber. It is of the single *fuselage* tractor type, equipped with a 700 h.p. twelve-cylindered Fiat engine (170 by 210 mm.) which is claimed to be the highest powered engine employed for air work. It has a span of 51 ft. 9 ins., a chord of 7 ft. 9 ins., overall length of 32 ft., and a total supporting surface of 775 sq. ft. The diameter of the tractor screw is 11 ft. 3 ins. The struts and wires are all streamlined. The weight of the machine empty is 2¼ tons, and the useful load 1½ tons.

Its maximum speed is 163 m.p.h., and its climbing speeds are as follows:—1,000 m. (3,280 ft.), in 3 mins. 45 secs.; 2,000 m. (6,560 ft.), in 7 mins. 30 secs.; 3,000 m. (9,842 ft.), in 12 mins. 30 secs.; 4,000 m. (13,123 ft.), in 18 mins. 16 secs.; 5,000 m. (16,400 ft.), in 27 mins.

The B.R. Fiat biplane which was flown last week from Turin to London, with stops at Rome and Paris



Lieut. Brack Papa, the pilot, who flew the B.R. Fiat machine from Turin to London, and the 12-cylindered 700 h.p. Fiat engine used in the flight

British Flying Officers Captured by Bolshevists

A WIRELESS message from Bolshevist sources on July 17 claimed that a British aeroplane had been obliged to land in the direction of the Northern Dvina, in consequence of motor trouble. The three occupants were taken prisoners.

London to Brussels in Three Hours

A FOUR-ENGINED Handley-Page aeroplane, piloted by Lieut.-Col. W. S. Douglas, D.F.C., M.C., left Cricklewood Aerodrome for Brussels at 7 o'clock on Saturday morning, and made a safe landing there at 10 o'clock the same morning.

FLIGHT

AIR TOUR AND TRAVEL IN THE NORTH

THE Avro Co.'s air lines are developing rapidly up North. Starting in May with stations at Blackpool and Southport, we learn that the company has now opened landing-grounds at Windermere (seaplanes), Morecambe, Fleetwood, Liverpool (Waterloo Sands), Rhyl and Douglas (Isle of Man). Six other stations are in course of formation which will make it possible for most people in Lancashire to travel by air to the South or West of England without the necessity for long train or motor-car journeys to Government aerodromes.

A table showing the distances saved by air travel in Lancashire is given herewith.

The chart is most instructive, as it illustrates the great saving, not only in distance, but also in time to be obtained by flying instead of travelling by train.

Business in joy-flying at Blackpool and Southport has been well maintained, the outstanding features of the week being the aerial visit of the Mayor of Blackpool, Alderman A. Parkinson, M.P., J.P., and the Rev. Mr. Little, the Vicar of Blackpool, to a meeting at Bolton, where they received a most cordial reception, and the flying of an entire wedding party, comprising bride, bridegroom, best man and 40 guests at Southport, and this in spite of clouds and mist at approximately 100 ft.

Another novelty was the flying from Southport of an Avro pilot on an experimental scout to the dinner at the Manchester Aerodrome to Sir John Alcock and Sir Arthur Brown. The pilot appeared from his machine in evening dress, and returned to Southport after the dinner, despite mist which almost enveloped the factory chimneys.

Two Avro seaplanes are now installed at Windermere, where Capt. Pixton, one of the veteran pilots of the day, is flying.

	Blackpool.	Fleetwood.	Harrogate.	Lancaster.	Leeds.	Liverpool.	Manchester.	Middlesbrough.	Morecambe.	Preston.	Southport.
Blackpool ..		**9**	**89**	**33**	**81**	**48**	**49**	**130**	**35**	**18**	**33**
		1	*26*	*13*	*19*	*20*	*8*	*39*	*15*	*3*	*21*
Fleetwood ..	**9**		**92**	**24**	**84**	**51**	**52**	**123**	**28**	**21**	**34**
	1		*32*	*10*	*23*	*15*	*8*	*38*	*16*	*4*	*16*
Harrogate ..	**89**	**92**		**70**	**18**	**93**	**61**	**50**	**74**	**71**	**86**
	26	*32*		*18*	*4*	*21*	*14*	*8*	*19*	*21*	*21*
Lancaster ..	**33**	**24**	**70**		**65**	**51**	**52**	**99**	**4**	**22**	**36**
	13	*10*	*18*		*11*	*5*	*6*	*26*	*1*	*1*	*6*
Leeds	**81**	**84**	**18**	**65**		**75**	**43**	**68**	**69**	**63**	**76**
	19	*23*	*4*	*11*		*10*	*7*	*13*	*14*	*15*	*15*
Liverpool ..	**48**	**51**	**93**	**51**	**75**		**32**	**143**	**35**	**30**	**20**
	20	*15*	*21*	*5*	*10*		*2*	*35*	*9*	*3*	*4*
Manchester ..	**49**	**52**	**61**	**52**	**43**	**32**		**114**	**56**	**31**	**35**
	8	*8*	*14*	*6*	*7*	*2*		*24*	*8*	*3*	*1*
Middlesbrough ..	**130**	**123**	**50**	**99**	**68**	**143**	**111**		**103**	**120**	**135**
	39	*38*	*8*	*26*	*13*	*35*	*24*		*28*	*38*	*38*
Morecambe ..	**35**	**28**	**74**	**4**	**69**	**35**	**56**	**103**		**29**	**54**
	15	*16*	*19*	*1*	*14*	*9*	*8*	*28*		*9*	*24*
Preston	**18**	**21**	**71**	**22**	**63**	**30**	**31**	**120**	**29**		**15**
	3	*4*	*21*	*1*	*15*	*3*	*3*	*38*	*9*		*1*
Southport ..	**33**	**34**	**86**	**36**	**76**	**26**	**35**	**135**	**54**	**15**	
	21	*16*	*21*	*6*	*15*	*4*	*1*	*38*	*24*	*1*	

Railway distance is given in **black type.**
Distance saved by air in *italics.*

FORMATION OF LANCASHIRE FLYING CLUB

THE first meeting of the Lancashire Flying Club was held at the Birkdale Palace Hydro, Birkdale, Southport, on July 19, after the Avro Gymkhana.

Mr. F. C. L. Young, Lindum Lodge, Bowden, Cheshire, was elected Hon. Secretary and Treasurer. Mr. Young already possesses a machine of his own, and has offered to place it at the disposal of the Club members.

It was decided that the subscription for the first 50 members be fixed at 10 guineas without entry fee, and that the Club be run primarily for the benefit of ex-Service pilots who wish to keep up their flying.

Maj. McMinnies offered free landings and storage for members' machines at the Avro aerodromes at Windermere, Douglas, Morecambe, Fleetwood, Blackpool, Southport, Liverpool, Preston, Rhyl, etc., and this offer was accepted.

It was decided to write to the Air Ministry with a view to obtaining a gift of several machines to the club, with a view to assisting ex-Service men to keep up their flying, and it was requested that the Club machines should be fully insured against all accidents and crashes.

All communications should be addressed to the Hon. Secretary, Lancashire Flying Club, at the address given above.

The R.A.F. in the Peace Procession

IN the Peace Procession on Saturday last the R.A.F. was represented by a contingent of 60 officers and 600 other ranks, together with 6 officers of the W.R.A.F. and 120 ranks. The contingent was headed by Maj.-Gen. Sir J. M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O., in command, followed by Brig.-Gen. C. L. Lambe, C.B., C.M.G., D.S.O., Col. C. R. Samson, C.M.G., D.S.O., A.F.C., Brig.-Gen. C. A. M. Longcroft, C.M.G., D.S.O., A.F.C., Brig.-Gen. E. M. Maitland, C.M.G., D.S.O., Lieut.-Col. C. L. N. Newall, C.M.G., and Staff, led the representative detachments which marched in the following order :—No. 5 Squadron, No. 7 Squadron, No. 9 Squadron, No. 11 Squadron, No. 12 Squadron, No. 18 Squadron, No. 22 Squadron, No. 25 Squadron, No. 29 Squadron, No. 43 Squadron, No. 57 Squadron, No. 59 Squadron, No. 62 Squadron, No. 70 Squadron, No. 84 Squadron, No. 88 Squadron, No. 92 Squadron, No. 110 Squadron, No. 208 Squadron, Parks and Depots, Airships, South-Eastern Area, South-Western Area, Midland Area, Northern Area, 29th Group, 11th Group, Chaplains and Medical Services.

The Loss of N.S. 11

No further information has come to light regarding the catastrophe to the non-rigid airship N.S. 11, referred to briefly in our last issue, except that it has been definitely ascertained that the airship foundered 4 miles north-west of the village of Salthouse, between Wells and Sheringham.

The following message has been received at Pulham Air Station from H.M. the King :—

"His Majesty the King desires to express his deepest sympathy with the relatives of those officers and men who lost their lives in the airship N.S. 11 while employed in mine-clearing operations."

The names of officers and ratings of the lost airship are as follows :—Capt. W. K. Warneford (commander), Capt. A. S. Elliott, Flight-Sergt. O'Connor, Sergt. Lewry, Sergt. Waghorn, Air-Araftsman J. Jacques, Air-Craftsman Cameron and Air-Craftsman Connelly.

Saved by German Prisoner

THE Air Ministry announces that a British aeroplane crashed and caught fire at a Wiltshire aerodrome where some German prisoners of war were employed.

The pilot was entrapped in the burning wreckage, and was in imminent danger of being burnt to death. One of the prisoners, Pte. L. Bruckman, 99th Infantry Reserve Regt., German Army, went to the officer's assistance and effected his rescue at great personal risk to himself.

It has been decided that Pte. Bruckman shall be released forthwith from captivity, and granted a free passage to his destination. It has also been decided to present him with a sum of money and a silver watch suitably inscribed in recognition of his gallant and chivalrous act.

Cambridge Honours Flying Generals

AMONG the long list of Admirals and Generals who are to be honoured with honorary degrees by Cambridge University are Maj.-Genl. Sir John Salmond and Maj.-Genl. Sir Hugh Trenchard.

First Amsterdam Aircraft Exhibition

IN the British section of the Dutch Exhibition which is being held in Amsterdam during August, in addition to the firms mentioned in FLIGHT of July 10 as being represented, we learn there will also be exhibits by A. V. Roe and Co., Marconi's Wireless Telegraph Co., Wireless Press, Ltd., British Emaillite Co., Geo. Williams and Co., Improved Liquid Glues Co., R. S. Watling and Sons, Farringdon Propeller and Engineering Co., and several other smaller firms. Visitors will be able to appreciate British construction, as several of our machines are to give demonstrations and passenger flights over the aerodrome in front of the exhibition building.

INTERNATIONAL FLYING CONVENTION

THE Air Ministry on Tuesday issued the text of the Convention relating to International Air Navigation [Cmd] agreed upon by the sub-commission dealing with aerial navigation at the Peace Conference.

The Convention has been agreed to by all the representatives, subject to certain reservations. The Convention has not been formally approved by the Supreme Council of the Peace Conference. It has, however, been agreed that it should be issued for the information of the public of the Allied and Associated States.

The following is the English text of the document, which is in English and French, both languages having equal validity :—

Chapter I.—General Principles

ARTICLE 1.—The contracting States recognise that every State has complete and exclusive sovereignty in the air space above its territory and territorial waters.

ARTICLE 2.—Each contracting State undertakes in time of peace to accord freedom of innocent passage above its territory and territorial waters as well as above the territories and territorial waters of its Colonies to the aircraft of the other contracting States, provided that the conditions established in this Convention are observed.

All regulations made by a contracting State as to the admission over its territory of the aircraft of the other contracting States shall be applied without distinction of nationality.

ARTICLE 3.—Each contracting State has the right, for military reasons or in the interest of public safety, to prohibit the aircraft of the other contracting States, under the penalties provided by its legislation and subject to no distinction being made in this respect between its private aircraft and those of the other contracting States, from flying over certain areas of its territory.

If it makes use of this right, it shall publish and notify beforehand to the other contracting States the location and extent of the prohibited areas.

ARTICLE 4.—Every aircraft which finds itself above a prohibited area shall, as soon as aware of the fact, give the signal of distress provided in Paragraph 17 of Annex D and land outside the prohibited area as near to it as possible and as soon as possible at one of the aerodromes of the State unlawfully flown over.

Chapter II.—Nationality of Aircraft

ARTICLE 5.—No contracting State shall, except by a special and temporary authorisation, permit the flight above its territory of an aircraft which does not possess the nationality of a contracting State.

ARTICLE 6.—An aircraft possesses the nationality of the State on the register of which it is entered, in accordance with the provisions of Section I (*c*) of Annex A.

ARTICLE 7.—An aircraft shall not be entered on the register of one of the contracting States unless it belongs wholly to nationals of such State.

An incorporated company cannot be the registered owner of an aircraft unless it possesses the nationality of the State in which the aircraft is registered, and unless the president or chairman of the company and at least two-thirds of the directors possess the same nationality, and unless the company fulfils all other conditions which may be prescribed by the laws of each State.

ARTICLE 8.—An aircraft cannot be validly registered in more than one State.

ARTICLE 9.—The contracting States shall every month exchange among themselves and transmit to the International Commission for Air Navigation copies of registrations and of cancellations of registration which shall have been entered on their official registers during the preceding month.

ARTICLE 10.—All aircraft engaged in international navigation shall bear their nationality and registration marks as well as the name and residence of the owner in accordance with Annex A.

Chapter III.—Certificates of Airworthiness and Competency

ARTICLE 11.—Every aircraft engaged in international navigation shall, in accordance with Annex B, be provided with a certificate of airworthiness issued or rendered valid by the State whose nationality it possesses.

ARTICLE 12.—The commanding officer, pilots, engineers, and other members of the operating crew of every aircraft shall, in accordance with Annex B, be provided with certificates of competency and licences issued or rendered valid by the State whose nationality the aircraft possesses.

ARTICLE 13.—Certificates of airworthiness and of competency and licences issued or rendered valid by the State whose nationality the aircraft possesses, in accordance with the regulations established by Annex B and Annex E and hereafter by the International Commission for Air Navigation, shall be recognised as valid by the other States.

Each State has the right to refuse to recognise for the purpose of flights within the limits of and above its own territory certificates of competency and licences granted to one of its nationals by another contracting State.

ARTICLE 14.—No wireless apparatus shall be carried without a special licence issued by the State whose nationality the aircraft possesses. Such apparatus shall not be used except by members of the crew provided with a special licence for the purpose.

Every aircraft used in public transport and capable of carrying 10 or more persons shall be equipped with sending and receiving wireless apparatus when the methods of employing such apparatus shall have been determined by the International Commission for Air Navigation.

This Commission may later extend the obligation of carrying wireless apparatus to all other classes of aircraft in the conditions and according to the methods which it may determine.

Chapter IV.—Admission to Air Navigation Above Foreign Territory

ARTICLE 15.—Every aircraft of a contracting State has the right to cross another State without landing. In this case it shall follow the route fixed by the State over which the flight takes place. However, for reasons of general security it will be obliged to land if ordered to do so by means of signals provided in Annex D.

Every aircraft which passes from one State into another shall, if the regulations of the latter State require it, land in one of the aerodromes fixed by the latter. Notification of these aerodromes shall be given by the contracting States to the International Commission for Air Navigation and by it notified to all the contracting States.

The establishment of international airways shall be subject to the consent of the States flown over.

ARTICLE 16.—Each contracting State shall have the right to reserve to its national aircraft the carriage of persons and goods for hire between two points on its own territory.

ARTICLE 17.—If a contracting State establishes restrictions of the kind permitted by Article 16, its aircraft may be subjected to the same restrictions in any other contracting State, even though the latter State does not itself impose these restrictions on other foreign aircraft.

Restrictions and reservations provided in Article 16 shall be immediately published, and shall be communicated to the International Commission for Air Navigation which shall notify them to the States interested.

ARTICLE 18.—The passage or transit of any aircraft with or without landing over or through the territory of any contracting State, including stoppages reasonably necessary for the purpose of such transit, shall not entail any seizure or detention of the aircraft by or on behalf of such State or any person therein, on the ground that the constitution or mechanism of the aircraft is an infringement of any patent, design, or model, duly granted or registered in such State. Every claim for an infringement of this kind shall be duly made in the country of origin of the aircraft.

Chapter V.—Rules to be Observed on Departure, on Landing, and when Under Way

ARTICLE 19.—Every aircraft engaged in international navigation shall be provided :—

(*a*) With a certificate of registration in accordance with Annex A.

(*b*) With a certificate of airworthiness in accordance with Annex B.

(*c*) With certificates and licences of the commanding officer, pilots, and crew in accordance with Annex E.

(*d*) If it carries passengers, with a list of their names.

(*e*) If it carries freight, with bills of lading and manifest.

(*f*) With log books in accordance with Annex C.

(*g*) If equipped with wireless, with the special licence prescribed by Article 14.

ARTICLE 20.—The log books shall be kept for two years after the last entry.

ARTICLE 21.—Upon the departure of an aircraft, the authorities of the country shall have, in all cases, the right to visit the aircraft and to verify all the documents with which it must be provided.

ARTICLE 22.—Upon the landing of an aircraft, the authorities of the country shall have, in all cases, the right to visit the aircraft and to verify all the documents with which it must be provided.

ARTICLE 23.—All persons on board an aircraft shall conform to the laws and regulations of the State visited.

In case of flight made without landing, from frontier to frontier, all persons on board shall conform to the laws and regulations of the country flown over, the purpose of which is to ensure that the passage is innocent.

Legal relations between persons on board an aircraft in flight are governed by the law of the nationality of the aircraft.

In case of crime or misdemeanour committed by one person against another on board an aircraft in flight the jurisdiction of the State flown over applies only in case the crime or misdemeanour is committed against a national of such State and is followed by a landing during the same journey upon its territory.

The State flown over has jurisdiction :—

(1) With regard to every breach of its laws for the public safety and its military and fiscal laws ;

(2) In case of a breach of its regulations concerning air navigation.

ARTICLE 24.—Aircraft of the contracting States shall be entitled to the same measures of assistance for landing, particularly in case of distress, as national aircraft.

With regard to the salvage of aircraft wrecked at sea the regulations of the several contracting States as to the salvage of ships will apply so far as practicable.

ARTICLE 25.—Every aerodrome in a contracting State, which upon payment of charges is open to public use by its national aircraft, shall likewise be open to the aircraft of all the other contracting States.

In every such aerodrome there shall be a single tariff of charges for landing and length of stay applicable alike to national and foreign aircraft.

ARTICLE 26.—Each contracting State undertakes to adopt measures to ensure that every aircraft flying above the limits of its territory, and that every aircraft under its flag, wherever it may be, shall comply with the regulations contained in Annex D. of the present Convention. It will punish all persons who do not obey these regulations.

Chapter VI.—Prohibited Transport

ARTICLE 27.—The carriage by aircraft of explosives and of arms and munitions of war is forbidden in international navigation. No foreign aircraft shall be permitted to carry such articles between any two points in the same contracting State.

ARTICLE 28.—Each State may prohibit or regulate the carriage or use of photographic apparatus. Any such regulations shall be at once notified to the International Commission for Air Navigation, which shall communicate this information to all the other contracting States.

ARTICLE 29.—As a measure of public safety, the carriage of objects other than those mentioned in Articles 27 and 28 may be subjected to restrictions by each contracting State. Any such regulations shall be at once notified to the International Commission for Air Navigation, which shall communicate this information to all the other contracting States.

ARTICLE 30.—All restrictions mentioned in Article 29 shall be applied equally to national and foreign aircraft.

Chapter VII.—State Aircraft

ARTICLE 31.—The following are deemed to be State aircraft :—(*a*) Military aircraft. (*b*) Aircraft exclusively employed in State service, such as posts, Customs, police. Every other aircraft is a private aircraft. All State aircraft other than military, Customs, and police aircraft shall be treated as private aircraft, and as such shall be subject to all the provisions of the present Convention.

ARTICLE 32.—Every aircraft commanded by a person in military service detailed for the purpose is deemed to be a military aircraft.

ARTICLE 33.—Neither the flight of a military aircraft of a contracting State over the territory of another nor its landing upon such territory shall be permitted without special authorization.

In case of such authorization the military aircraft shall enjoy in the absence of special stipulation the privileges of exterritoriality which are customarily accorded to foreign ships of war.

A military aircraft which is forced to land or which is required or compelled to land shall, by reason thereof, acquire no right to exterritoriality.

ARTICLE 34.—Agreements between State and State will determine in what cases police and customs aircraft can be authorized to cross the frontier. They shall in no case be entitled to the privileges of exterritoriality.

Chapter VIII.—International Commission for Air Navigation

ARTICLE 35.—There shall be instituted, under the name of the International Commission for Air Navigation and as part of the organization of the League of Nations, a permanent Commission composed of :—

Two representatives of each of the following States : The United States of America, France, Italy, and Japan ;

One representative of Great Britain and one of each of the British Dominions and of India ;

One representative of each of the other contracting States.

Each of the five States first-named (Great Britain, the British Dominions and India counting for this purpose as one State) shall have the least whole number of votes which, when multiplied by five, will give a product exceeding by at least one vote the total number of votes of all the other contracting States.

All the States other than the five first-named shall each have one vote.

The International Commission for Air Navigation shall determine the rules of its own procedure and the place of its permanent seat, but it shall be free to meet in such places as it may deem convenient. Its first meeting shall take place at Paris. This meeting shall be convened by the French Government, as soon as a majority of the signatory States shall have notified to it their ratification of the present Convention.

The duties of this Commission are :—

(*a*) To receive proposals from or to make proposals to any of the contracting States for the modification or amendment of the provisions of the present Convention and to notify changes adopted.

(*b*) To carry out the duties imposed upon it by the present Article and by Articles 9, 13, 14, 15, 17, 28, 29, and 38 of the present Convention.

(*c*) To amend the provisions of the technical Annexes.

(*d*) To collect and communicate to the contracting States information of every kind concerning international air navigation.

(*e*) To collect and communicate to the contracting States all information relating to wireless meteorology and medical science which may be of interest to air navigation.

(*f*) To ensure the publication of maps for air navigation in accordance with the provisions of Annex F.

(*g*) To give its opinion on questions which the States may submit for examination.

Any modification of the provisions of any one of the Annexes may be made by the International Commission for Air Naivgation when such modification shall have been approved by three-fourths of the total possible vote and shall become effective from the time when it shall have been notified by the International Commission for Air Navigation to all the contracting States.

Any proposed modification of the articles of the present Convention shall be examined by the International Commission for Air Navigation, whether it originates with one of the contracting States or with the International Commission for Air Navigation itself. No such modification shall be proposed for option by the contracting States, unless it shall have been approved by at least two-thirds of all the possible votes which could be cast if all the States were present.

All such modifications of the articles of the Convention (not of the provisions of the Annexes) must be formally adopted by the contracting States before they become effective.

The expenses of organisation and operation of the International Commission for Air Navigation shall be borne by the contracting States in proportion to the number o votes at their disposal.

The expenses occasioned by the sending of technical delegations will be borne by their respective States.

Chapter IX.—Final Provisions.

ARTICLE 36.—Each contracting State undertakes to co-operate as far as possible in international measures concerning :—

(*a*) The collection and dissemination of statistical, current, and special meteorologial information, in accordance with the provisions of Annex G.

(*b*) The publication of standard aeronautical maps, and the establishment of a uniform system of ground marks for flying, in accordance with the provisions of Annex F.

(*c*) The use of wireless in air navigation, the establishmen$_t$

of the necessary wireless stations, and the observation of international wireless regulations.

ARTICLE 37.—General provisions relative to customs in connection with international air navigation are the subject of a special agreement contained in Annex H to the present Convention.

Nothing in the present Convention shall be construed as preventing the contracting States from concluding, in conformity with its principles, special protocols as between State and State in respect of customs, police, posts, and other matters of common interest in connection with air navigation.

ARTICLE 38.—In the case of a disagreement of two or more States relating to the interpretation of the present Convention the question in dispute shall be determined by the Permanent Court of International Justice to be established by the League of Nations and until its establishment by arbitration.

If the parties do not agree on the choice of the arbitrators, they shall proceed as follows :—

Each of the parties shall name an arbitrator, and the two arbitrators shall meet to name a third. If the arbitrators cannot agree, the parties shall each name a third State, and the third State so named shall proceed to designate the third arbitrator, by agreement or by each proposing a name and then determining by lot the choice between the two.

In case of the disagreement of two or more contracting States relating to one of the technical regulations annexed to the present Convention, the point in dispute shall be determined by the decision of the International Commission for Air Navigation by a majority of votes.

In case the difference involves the question whether the interpretation of the Convention or that of a regulation is concerned, final decision shall be made by arbitration as provided in the first paragraph of this Article.

ARTICLE 39.—In case of war, the provisions of the present Convention do not affect the freedom of action of the contracting States either as belligerents or as neutrals.

ARTICLE 40.—The provisions of the present Convention are completed by the Annexes A-H, which have the same effect and come into force at the same time as the Convention itself.

ARTICLE 41.—The British Dominions and India are deemed to be States for the purposes of the present Convention. Protectorates, or territories administered by the League of Nations or placed under its control, are, for the purposes of the present Convention, deemed to form part of the Protecting or Mandatory States, both as regards their territory and as regards their nationals.

ARTICLE 42.—The present Convention shall come into force as between any of the contracting States as soon as such States shall have exchanged ratifications, which shall take place within one year. The ratifications shall be deposited in the archives of the Ministry of Foreign Affairs of the French Republic.

ARTICLE 43.—The States which have not taken part in the present War shall be admitted to adhere to the present Convention upon their simple declaration notified to the Ministry of Foreign Affairs of the French Republic, which shall inform the contracting States of such adherence.

ARTICLE 44.—Any State which took part in the present War but which did not take part in the negotiation of this Convention may express its desire to adhere to this Convention and may be admitted to adhere to it, if such a State is a member of the League of Nations, or until January 1, 1923, by a unanimous vote of the signatory and adhering States or, after January 1, 1923, by an affirmative vote comprising at least three-fourths of the total possible votes of the signatory and adhering States, the votes of the different States having the same weight as that provided by Article 35 of this Convention for the International Commission for Air Navigation.

The Ministry of Foreign Affairs of the French Republic shall receive requests for adherence to this Convention under the conditions provided by this article, shall communicate them to the contracting States, shall receive the votes of the contracting States, and shall announce the result of the vote.

ARTICLE 45.—The denunciation of the present Convention shall take effect with regard only to the State which shall have given notice of it. Such notice shall not be given before January 1, 1922 (nineteen hundred and twenty-two), and the denunciation shall not take effect until at least one year after the giving of notice.

Notices under this article shall be given to the Ministry of Foreign Affairs of the French Republic, who shall communicate them to the contracting States.

Adjoined to the Convention are several annexes and appendices dealing with such subjects as the marking and registration of aircraft, with airworthiness, log-books, and rules of the air. These rules follow those of navigation by sea in many respects. For example, the lights to be carried by an aeroplane are a white headlight and a white light aft, with red and green lights for port and starboard. Airships have all these lights doubled, while balloons carry a single light below the car. Heavier-than-air machines give way to balloons and airships. The sea rule also applies to motor-driven aircraft meeting end on—each turns to the right.

Regulations for granting pilots' certificates are dealt with, as are the rules for making international and local maps, the character of ground marks, collection and reporting of meteorological information, and Customs.

R. 34 Officers See the King

BRIG.-GENL. E. M. MAITLAND and Maj. Scott had the honour of being received by the King at Buckingham Palace on July 16, when they gave His Majesty a personal account of the voyage of the R. 34 to America and back. The King heartily congratulated both officers on the success of the trip.

On the following day Genl. Maitland and Maj. Scott had the honour of being received by Queen Alexandra at Marlborough House.

King Albert's Aerial Visit to England

ON July 15 the King of the Belgians paid another flying visit to England, his Airco 4a starting from Brussels and landing at Hounslow. The visit was of an unofficial character, the object being to see his son, Prince Leopold, at Eton. He was accompanied across the Channel by Commander van O. Verstraeten. The journey from Hounslow to Eton was made by motor car. A few days later King Albert returned to Belgium by the aerial way.

From Felixstowe to Denmark

A FINE flight between England and Denmark was the trip of E. 5-N. 90 on July 19. At 5.30 p.m. the seaplane arrived here from Felixstowe, which she left at 9 o'clock that morning, making a successful non-stop trip, says the *Daily Telegraph* correspondent at Copenhagen. Capt. Baily was the pilot and Maj. Sittwell the observer. An official of the Foreign Office and two non-commissioned officers were also on board. The officers were heartily welcomed by Danish naval aviators. The flight was made at a height of 3,000 ft. to 6,000 ft., and a speed of 60 knots, and the route followed was along the Dutch coast, where there was rain and fog, the Kiel Canal, the islands of Laaland and Falster, and across the Sound to Copenhagen. The machine was in wireless communication with Felixstowe till her arrival off the German coast. This morning the party left on the seaplane for Helsingfors on a special mission for the British Foreign Office, carrying a heavy mail. The distance from Felixstowe to Copenhagen is about 560 miles.

Flight to Norway

THE Air Ministry announces : One of the S. 5 flying boats engaged in the Scandinavian trip reached Christiansand from Dundee on Monday at 5.30 p.m., having accomplished the journey of 430 sea miles in 7½ hours. As the flight was made through thick fog and driving rain, the performance is regarded as a particularly good one.

Martinsyde Withdrawn from Transatlantic Flight

ILL-LUCK pursues the Martinsyde aeroplane, which again met with a mishap following a trial on July 17. It appears that the machine, after running about 300 yards, got about 120 ft. off the ground and then dived downwards. The crash seriously damaged the machine, but both the pilot, Mr. Raynham, and the navigator, Lieut. Biddlecomble, escaped injury. Subsequently it was announced that Mr. Raynham had received orders to return home, and the machine was packed up for dispatch by the steamship *Grampian*.

Air Work on Afghan Frontier

A MESSAGE from Simla on July 19 states that our aeroplanes bombed hostile gatherings at Chora.

A New German Aero Engine

ACCORDING to a rumour which has reached Paris via Zurich several big German works, including Krupps, of Essen, are conducting in the most profound secrecy experiments with a new aviation motor much superior to the old style.

It would appear to be a gas turbine, and to be more or less noiseless.

Giant aeroplanes capable of carrying 64 persons are said to have been built with the new motor.

FLIGHT

THE ROYAL AIR FORCE

London Gazette, July 15

The following temporary appointments are made :—

Staff Officer, 1st Class (T.).—Maj. A. Struben, O.B.E. ; June 1.
Staff Officer, 2nd Class (T.).—Capt. H. T. Humfress ; June 1.
Staff Officer, 2nd Class (T.).—Capt. W. J. B. Curtis, O.B.E. ; June 1.

Flying Branch

Capt. W. R. Read, M.C., A.F.C., to be actg. Maj. whilst employed as Maj. (A.) ; June 4.

Capt. B. E. Baker, D.S.O., M.C., A.F.C., to be graded for purposes of pay and allowances as Maj. whilst employed as Maj. (A.) ; May 1.

Capt. A. N. Gallehawk to be graded for purposes of pay and allowances as Maj. (A. and S.) while specially employed ; May 15.

Capt. R. S. Smith to be graded for purposes of pay and allowances as Maj. whilst employed as Maj. (K.B.) ; May 1.

Capt. W. R. Mackenzie, D.S.C., to be Capt. (S.) from (Ad.) ; June 6.

Lieut. D. C. W. Sanders to be actg. Capt. whilst employed as Capt. (A.), from Oct. 3, 1918, to April 30.

Lieut. L. Balfour to be actg. Capt. whilst employed as Capt. (K.B.) ; May 1.

Lieuts. to be graded for purposes of pay as Capts. whilst employed as Capts. (A.) :—V. W. Burgess, A. L. Chick, A.F.C., M. V. McKeon, E. H. Russell ; May 1.

Lieut. J. S. Giffard to be graded for purposes of pay and allowances as Capt. whilst employed as Capt. (K.B.), from May 1 to June 13.

Lieut. H. L. Macro, D.F.C., to be graded for purposes of pay and allowances as Capt. whilst employed as Capt. (S.) ; May 1.

Lieut. A. G. Lamplugh ceased to be graded for pay and allowances as Capt. (A.) ; June 20.

Lieuts. to be Lieuts. (A.) from (Ad.) :—E. P. Moxey ; May 21. H. R. Eycott-Martin, M.C. ; June 27.

Lieut. L. H. Phelps to be Lieut. (O.), from (Ad.) ; Jan. 21.

Sec. Lieut. C. J. Craft to be Lieut. ; May 17.

Sec. Lieut. H. Wensley (late Gen. List, R.F.C., on prob.) is confirmed in rank as Sec. Lieut. (A.) ; Feb. 7.

Sec. Lieut. C. O. Rigden (late Gen. List, R.F.C., on prob.) is confirmed in rank as Sec. Lieut. (A.) ; Feb. 8.

H. D. E. Rolland (Lieut., Quebec R.) is granted a temp. commn. as Sec. Lieut. (O.) ; Nov. 6, 1918, and to be Hon. Lieut.

R. A. Coward (Sec. Lieut., E. Lan. R.) is granted a temp. commn. as Sec. Lieut. (O.) ; Nov. 7, 1918.

The following relinquish their commns. on ceasing to be employed :—Lieut. W. McL. Walbank (Lieut., Can. F. Art.) ; March 31. Lieut. J. C. F. Owen (Capt., Can. A.S.C.) ; April 30. Lieut. (Hon. Capt.) G. M. Brawley (Capt., Cent. Ont. R.) ; May 15. Lieut. C. B. Green (Lieut., Cent. Ont. R.) ; May 16. Sec. Lieut. (Hon. Lieut.) J. B. McKenzie (Lieut., West Ont. R.) ; June 1. Sec. Lieut. (Hon. Capt.) C. A. Mackintosh-Walker (Capt., Cameron Highrs.) ; June 12. Lieut. H. A. E. Matthews (Lieut., Dorset R.) ; June 20. Lieut.-Col. A. C. Barnby (Maj., R. Marines) ; June 21. Maj. A. H. Morton, M.C. (Capt., R.H. and R.F.A.) ; June 22. Sec. Lieut. (Hon. Lieut.) T. Varcoe (Lieut., R.H. and R.F.A.) ; June 23. Sec. Lieut. (Hon. Lieut.) G. H. Bisaillon (Lieut., Can. Forestry Corps) ; June 27. Lieut. T. S. Russell-Rigby (Lieut., Alberta R.) ; July 3. Lieut. H. R. Kincaird, M.C. (Lieut., E. Ont. R.) ; July 4. Lieut. D. H. Macintyre (Lieut., Argyll and Suth. Highrs.) ; July 7.

(Then follow the names of 320 officers who are transfd. to the Unemployed List under various dates. We regret that owing to great pressure on our space it is impossible to reprint this portion of the List.—ED.)

Capt. G. H. Morton (Brit. Columbia R.) relinquishes his commn. on account of ill-health ; July 1.

Lieut. J. A. B. Colin relinquishes his commn. on account of ill-health, and is permitted to retain his rank ; June 19.

The following Lieuts. relinquish their commns. on account of ill-health contracted on active service :—G. M. Shaw (Cent. Ont. R.) ; March 12 (substituted for notification in *Gazette* of June 20). J. Y. Baird (Sco. Rif.) ; July 9. Lieut. R. S. Herring, M.C. (Lond. R.) (caused by wounds) ; July 17.

Lieut. R. Tyack resigns his commn. ; July 16.

Lieut. P. A. H. de Metz to take rank and precedence as if his appointment as Lieut. bore date July 1, 1918.

Lieut. H. S. Symons to take rank and precedence as if his appointment as Lieut. bore date April 1.

Lieut. E. A. Clear to take rank and precedence as if his appointment as Lieut. bore date June 13.

The following Sec. Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—H. A. Lye (caused by wounds) ; July 4 (substituted for notification in *Gazette* of Jan. 10). W. H. Saunders (contracted on active service) ; July 8.

The following Sec. Lieuts. resign their commns. :—J. H. Doughty-Davies, J. Hunt ; July 16.

Sec. Lieut. J. B. O'Neil is dismissed the Service by sentence of a General Court-martial ; June 23.

The rank of Lieut. T. G. Murray is as now described, and not Sec. Lieut., as stated in *Gazette* of Feb. 14.

The rank of Lieut. W. L. Goddard is as now described, and not Sec. Lieut., as stated in *Gazette* of July 4.

The notification in the *Gazette* of Oct. 25, 1918, concerning 475312 Cdt. G. C. Boyer is cancelled.

The notification in the *Gazette* of March 18 concerning Sec. Lieut. S. G. Shand is cancelled.

The notification in the *Gazette* of April 25 concerning Sec. Lieut. L. S. Macdonald is cancelled.

The notification in the *Gazette* of May 23 concerning Sec. Lieut. J. A. De Gaye is cancelled.

The notification in the *Gazette* of June 13 concerning Lieut. F. E. Short is cancelled. (The notification in the *Gazette* of June 3 to stand).

Administrative Branch

Majs. to be Majs., from (S.O.) :—A. B. Winch ; March 19. H. A. Moore, C.B.E., M.C. ; July 1.

Lieut. (Hon. Capt.) C. H. Lewis to be actg. Maj. whilst employed as Maj ; May 1.

Capt. W. G. Scott to be actg. Maj., without pay and allowances of that rank, whilst employed as Recruiting Officer ; May 1.

To be graded for purposes of pay and allowances as Capts., and to be actg. Majs., without pay and allowances of that rank, whilst employed as Recruiting Officers :—Lieut. F. T. Chapman, Lieut. R. Tait, Lieut. G. B. Redgrave, Lieut. A. R. Harris, Lieut. F. V. Bell, Sec. Lieut. A. E. H. Hales ; May 1.

Capts. to be Capts., from (S.O.) :—K. B. Harbord ; March 15. R. S. Lindsell, O.B.E. ; June 1. G. C. Corry-Smith ; July 1.

Lieuts. to be actg. Capts. whilst employed as Capts. :—K. A. Meek, F. H. Sims ; May 1.

Administrative Branch—continued.

Lieut. A. G. Maddock to be actg. Capt. whilst specially employed, from (T.), from Dec. 21, 1918, to April 30.

Lieuts. to be graded for purposes of pay and allowances as Capts. whilst specially employed :—A. G. Maddock (to June 13), H. B. Stutfield ; May 1.

Lieuts. to be graded for purposes of pay and allowances as Capts. whilst employed as Capts. :—G. W. T. Pireira, J. J. Wilson, H. W. G. Ripley ; May 1.

Lieut. (Hon. Capt.) (actg. Capt.) G. M. Smyth to be Lieut., from (S.O.), and to relinquish the actg. rank of Capt. ; April 1.

Lieut. G. A. F. Hudson to be Lieut., from (S.O.) ; June 25.

Sec. Lieut. H. O. Warren to be Sec. Lieut., from (A.) ; Nov. 25, 1918 (substituted for the notification in the *Gazette* of Feb. 18).

(Then follow the names of 88 officers who are transfd. to the Unemployed List under various dates.)

The following Capts. relinquish their commns. on account of ill-health :—R. L. Kennedy (Lieut., Hrs.) (caused by wounds) ; July 3. J. W. W. Bridges (Coldstream Gds.) (contracted on active service) ; July 10.

Lieut. H. M. Tysoe to take rank and precedence as if his appointment as Lieut. bore date Nov. 12, 1918.

Sec. Lieut. F. C. Hilbert relinquishes his commn. on account of ill-health, and is permitted to retain his rank ; June 11.

The following Sec. Lieuts. resign their commns. :—C. W. Garrood, A. Giles ; July 16.

The notification in *Gazette* Dec. 24, 1918, concerning Sec. Lieut. G. Barfoot-Saunt is cancelled.

The notifications in *Gazette* March 14 and March 28 concerning Sec. Lieut. A. P. Manners are cancelled.

The notification in *Gazette* April 18 concerning Capt. P. Le G. Gribble is cancelled.

The notification in *Gazette* May 23 concerning Lieut. C. F. Morris is cancelled (notification in *Gazette* June 20 to remain).

Technical Branch

Majs. to be actg. Lieut.-Cols. whilst employed as Lieut.-Cols., Grade (A.) :—A. S. Morris, O.B.E., C. G. Smith, O.B.E., R. F. Stapleton-Cotton ; May 1.

Capt. L. H. B. Cosway to be actg. Maj. whilst employed as Maj. ; June 1.

Capt. W. W. Hall to be actg. Maj. whilst employed as Maj., Grade (A.) ; May 1.

Lieut. T. L. F. Burnett to be actg. Maj. whilst employed as Maj., Grade (B.) ; May 1.

To be graded for purposes of pay and allowances as Majs. whilst employed as Majs. (May 1) :—Capt. (Hon. Maj.) C. C. Colley (Grade A.), Lieut. R. W. Davies (Grade A.), Capt. J. C. Forsyth (Grade B).

To be actg. Capts. whilst employed as Capts., Grade (A.) :—Sec. Lieut. J. A. Atkinson, from Dec. 10, 1918, to March 8 (substituted for notification in *Gazette* May 30). Lieut. J. H. Secker ; May 1.

To be actg. Capts. whilst employed as Capts., Grade (B) :—Lieut. J. R. Frankish, Lieut. E. E. Porter, to May 28, Lieut. H. G. Wood, Sec. Lieut. J. H. Lytle ; May 1.

Lieuts. to be graded for purposes of pay and allowances as Capts. whilst employed as Capts., Grade (A.) :—C. C. Bracebridge, C. M. Seth-Ward, to May 12, (Hon. Capt.) R. Godfrey, J. Shields, H. G. Thomas ; May 1. H. A. Adams ; May 13.

To be graded for purposes of pay and allowances as Capts. while employed as Capts., Grade (B.) :—Lieut. O. W. de Putron, Sec. Lieut. (actg. Lieut.) W. A. Fowler ; May 1.

Lieut. A. W. Allan to be Lieut., Grade (A.), from Grade (B.) ; March 2.

Lieut. T. Kerr-Jones to be graded for pay and allowances as Lieut. while employed as Lieut., Grade (A.) (from April 4 to 30).

Lieut. A. Garrjty to be graded for pay and allowances of Lieut. while employed as Lieut., Grade (B.) ; Oct. 3, 1918 (substituted for notification in *Gazette* Dec. 17, 1918).

Lieut. E. L. Pollard to be Lieut., Grade (B.), from (O.) ; May 22, 1918 (substituted for the notifications which appeared in *Gazettes* June 28, 1918, and Feb. 28).

Sec. Lieuts. to be Lieuts. :—F. W. Atkinson ; Dec. 30, 1918 (substituted for notification in *Gazette* Jan. 3). E. G. Hellard ; Feb. 16.

Sec. Lieut. C. Littlejohn to be actg. Lieut. while employed as Lieut., Grade (B.) ; May 1.

(Then follow the names of 78 officers who are transfd. to the Unemployed List under various dates.)

Lieut. S. T. Hosken relinquishes his commn. on account of ill-health, and is permitted to retain his rank ; July 2.

Sec. Lieut. (Hon. Lieut.) A. Dingwall relinquishes his commn. on account of ill-health caused by wounds, and is permitted to retain the rank of Lieut. ; July 7.

The notification in *Gazette* of June 13 concerning Lieut. G. Thomas is cancelled.

The notification in *Gazette* of May 16 concerning Lieut. J. W. McKee is cancelled.

The notification in *Gazette* of April 4 concerning Sec. Lieut. B. L. T. Latour is cancelled (notification in *Gazette* of April 1 to remain).

Medical Branch

(8 officers transfd. to Unemployed List.)

Chaplains' Branch.

(2 officers transfd. to Unemployment List.)

Memoranda

(Then follow the names of seven Overseas Cadets granted temp. commns. and 528 Cadets granted hon. commns. as Sec. Lieuts.)

Lieut.-Col. (actg. Brig.-Gen.) C. G. Hoare, C.M.G. (Maj., Ind. Army) relinquishes his commn. on ceasing to be employed ; April 24.

Temp. Hon. Lieut. H. Pearse relinquishes his commn. on ceasing to be employed ; June 16.

(Then follow the names of five officers who are transfd. to the Unemployed List under various dates.)

Capt. (actg. Maj.) P. Le G. Gribble relinquishes his commn. on account of ill-health, and is granted the rank of Maj. ; April 19.

Capt. Hon. R. G. Lord St. Oswald (Capt., C. Gds.) resigns his commn., and is permitted to retain his rank ; July 16.

Lieut. A. Graham relinquishes his commn. on account of ill-health, and is granted the rank of Capt. ; July 7.

The notifications in *Gazette* of June 17 concerning the following officers are cancelled :—Capt. W. G. Scott, Lieut. F. T. Chapman, Lieut. R. Tait, Lieut. G. B. Redgrave, Lieut. A. R. Harris, Lieut. F. V. Bell, Sec. Lieut. A. E. H. Hales.

The notification in *Gazette* of June 6 concerning P.F.O. J. W. D. Archibald is cancelled.

The notification in *Gazette* of June 13 concerning Maj. R. E. Childers, D.S.C., is cancelled.

THE SERCK RADIATOR WORKS

An Interesting Inspection

ON Tuesday last, July 15, the Motor Radiator Manufacturing Co. opened their works, at Warwick Road, Greet, on the outskirts of Birmingham, to a gathering of technical pressmen. The idea of the function was merely that those who had known Mr. Peter Serck throughout almost the whole history of automobilism and aviation should be able to see how vastly his plant has increased in extent and output-capacity under the stimulus of five years of War-work. Mr. Serck, Mr. Purchase and Mr. Terry divided the duties of showing the visitors round, and it is safe to say that the majority of their guests learned more about the ins-and-outs of the radiator manufacturing business in half-an-hour's stroll around this plant than could possibly have been absorbed anywhere else, or in any other manner.

From the receipt of raw material—hundreds of tons of brass, copper, aluminium, spelter, etc.—to the crating of the finished product, there was nothing omitted from the "revelation." One saw radiators ranging from the attractive little cooler of the 10 h.p. A.C. to the gigantic job fitted on the Vickers-Vimy bombing aircraft—seeing them not only as completed radiators, but in every stage of their evolution. One Serck radiator may be thought very much like another, but the least discriminating visitor could soon see surprising variations, both of type and treatment of the cooling problem.

Mr. Serck, who is a Norwegian, returned only recently from some particularly exciting intercourse with the Bolsheviki in Petrograd, knows the motoring "capitals" of every country in the world, and is—one was pleased to learn—just as well able to book radiator contracts in the United States of America as he is in the country he has now for so many years regarded as being just as much his home as is Norway. He founded the present business in Bermondsey about twelve years ago. No sooner had he got his plant running nicely in south-east London, however, than he was compelled to go to the mountain, so to speak, moving up to Parkside, Coventry, in 1910, when Mr. Purchase joined him as works manager. Three years later the business had once more outgrown the factory. Mr. Serck then bought four acres of land at Greet, and erected on it a works designed and laid-out especially for the business of radiator manufacture.

When the War came along he foresaw great difficulty in getting tubing, so with characteristic resolution put down his own tube-drawing mills, of such production-potentiality that he is not only independent of other sources of supply for his own requirements, but is also able to furnish tubing for other manufacturers.

In 1918 the Government swooped down and took over the works, so that every machine in the plant stilll bears the imprint of the Ministry of Munitions, or this, that or other Department. The works were released from control in May last, however, and the company at once added to their equipment—designing and building quite a lot of the tools themselves, by the way—so that when the factory is running at full output it will be capable of turning out at least 50,000 radiators per annum.

One does not remember a more interesting insight into production than was afforded at Greet on Tuesday last, although the geniality of Mr. Serck and his colleagues tended to make one forget that information was being absorbed. They work like niggers, at the Serck radiator plant, but they have mastered the art of being busy without being blusterous, and keeping things humming without getting lugubrious. To judge by the remarks of manufacturers like Mr. J. K. Starley, of the Rover Co., Mr. Joseph Lisle, of the Star Co., Mr. Kay, of the Sunbeam Co., and Mr. Allan, of Austin's, Serck radiators are *the* radiators. Any customer who has once tried them seems consistently to adhere to the products of "Peter the Great," and after seeing the extent and organisation of his works it is easily understood that his company's output really should be, as it is, *hors concours*.

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SIDE-WINDS

A VERY remarkable publication is an album which has been prepared by Messrs, Ruston and Hornsby, of Lincoln, Grantham and Stockport, which illustrates some of the work done by the firm during the War years 1914-15-16-17 and 18. It opens with a brief history of the firm from its foundation, and then there are pages and pages of photographs of vehicles of all sorts, guns, bombs, aeroplanes, aero engines, etc., which have been produced by the firm for use by one or other of the three Services. The photographs have all been beautifully mounted, and the appearance of each page is considerably enhanced by the tasteful arrangement of sketches round the photographs. There are a good many photographs showing productions of the Aviation Department of Ruston and Hornsby, which, it may be remembered, built the machine flown by the late Lieut. W. L. Robinson, V.C., when he brought down the German airship at Cuffley. That this department did its bit is indicated by the fact that the 1,000th aeroplane was completed on January 4, 1918. The firm also supplied a very large number of aero engines to the flying services. The Ruston album has been most beautifully reproduced, and forms a souvenir of the War which will be valued by those who are fortunate enough to obtain one.

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MR. FRANK LANCHESTER has been unanimously elected by the Council President of the S.M.M.T. in succession to Mr. Albert Brown. Mr. E. M. C. Instone and Mr. J. Maughfling have been elected Vice-Presidents. The latter had for some time been Honorary Treasurer of the Society in which office he is now succeeded by Mr. A. S. Mays-Smith. The Management Committee of the Society elected from the Council will include the Past Presidents—Mr. F. R. Sims Mr. Sidney Straker, Mr. E. Manville, Mr. S. F. Edge, and Mr. Albert Brown.

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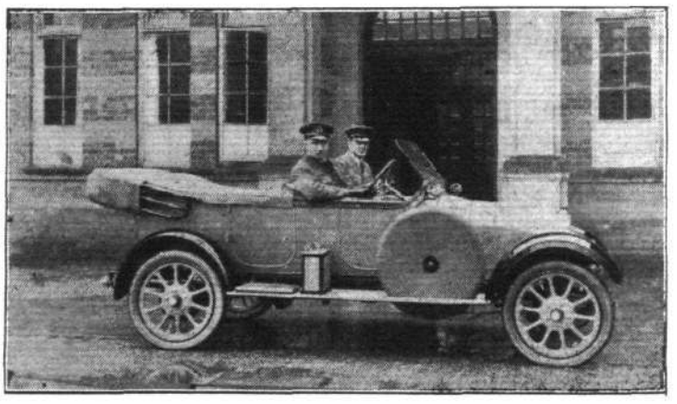
THE BRITISH LIGHTING AND IGNITION CO., LTD., who during the War have been established at 204, Tottenham Court Road, London, W. 1, have now removed their head office and works to Birmingham. The new factory, which is a very extensive one, is situated in Cheston Road, Aston, Birmingham, and will in future be known as the B.L.I.C. works. The London depôt and repair works has been established at 201, Tottenham Court Road, and magneto repairs, armature winding, etc., will be dealt with both at that address and the Birmingham factory.

FOR their sports, which this year were held at Guildford on Saturday last, the Martinsyde Recreation Club were not so fortunate as regards the weather as they have been in the past. The rain, however, was not so heavy as to interfere with the arrangements. The programme, as usual, was a very big one and there was always something going on from 11 a.m. to dark, as after the prizes were presented by Mrs. Martin, dancing was indulged in to the strains of the Martinsyde Orchestra. The band of the 2nd Battn. The Queen's also rendered a selection of music during the day. One sign of the changed conditions was the disappearance of many of the events for the ladies, which had been such a feature of war-time sports. Many of the events were keenly contested, notably the 100 yards open handicap, in which W. A. Hill, the Surrey A.C. champion, won by half a yard from scratch in 10 secs. The 120 yards hurdle race, won by K. L. Carruthers by a couple of yards, also provided an exciting race. A word of praise must be accorded



Our photograph shows Sir John Alcock, K.B.E., D.S.C., and Sir Arthur Whitten Brown, K.B.E., when Sir John took delivery of his new 10 h.p. Humber four-seater. The Atlantic flyers are shown outside the front entrance of the Humber works at Coventry.

"Flight" Copyright.

AT THE MARTINSYDE ANNUAL SPORTS: Held at Guildford on July 19.—1. "The firm," Messrs. Martin (right) and Handasyde (left), snapped on the Guildford sports ground, where the carnival was held. 2. "Pussy-foot" entertained the crowd with his antics. 3. The 100 yards open handicap, won by W. A. Hill, the Surrey champion. 4. Girls (7 to 16 years) race, the winner being found in the little sport nearest the camera. 5. The Fitters' "A" Team pulled well in the Tug-of-War. 6. 120 yards Hurdle Race. 7. A snap just after the start of the Ladies' Race. 8. The One-Mile Closed Handicap. Half way. Won by No. 316 (Y. Davis); 346, 2nd; 408, 3rd. 9. Getting over the top in the Quarter-Mile Obstacle Race. 10. Wheelbarrow Race.

to the officials, including Messrs. H. P. Martin and G. N. Handasyde, F. H. Campkin and many others for their energetic labours during the day.

THE temporary withdrawal of the restrictions on flying to the Continent has enabled the business value of the aeroplane to be demonstrated. In one instance the managing director of a well-known firm, being summoned from Liverpool to an urgent interview in Paris, came up to London by train on the Monday night, and telephoned for an aeroplane to be ready at Hendon at 7.30 a.m. next morning to take him on by air to Paris. The machine, an Airco 9, piloted by Capt. Shaw, ascended punctually at the time stated, and, in spite of cloud and rain, reached the aerodrome at Le Bourget, near Paris, at 10 a.m., having averaged a speed of 100 miles an hour. Whereupon the aerial traveller, Mr. Pilkington, of Pilkington Brothers, motored at once into Paris. On the following day, Wednesday, having completed his business he returned again to London by air in the same machine. This successful journey was, it is interesting to note, the first in connection with the temporary withdrawal of the restrictions on flying between London and Paris.

THE Selsdon Aero and Engineering Co., Ltd., have now commenced operations at Somerton Works, Cowes, Isle of Wight. Material or supplies should be advised to the works to which they are sent, and invoices forwarded to the central buying department at Sanderstead Road, Croydon, to which all monthly statements should be rendered.

IT is the little details that count, and so "K.L.G." plugs were fitted on the "Sunbeam-Coatalen" engines of the British airship "R.34" in her victory flight across the Atlantic. Naturally they gave every possible satisfaction and largely contributed to the success of the voyage out and home.

IT is a noteworthy fact that "K.L.G." plugs were used on all British machines flying the Atlantic—first on the Sopwith (Hawker-Grieve) machine, then on the "Vickers-Vimy" (Alcock-Brown) and in the British airship "R.34." All were available; "K.L.G." were chosen!

BY reason of its peninsular formation, Denmark has always suffered many of the handicaps of isolation. The tedious sea journey to the other countries of Scandinavia or to Britain, or the inconvenient train route through Hamburg to the rest of Europe, have militated against the speediest trade relations, and to obviate these limitations extensive aerial services are now being organised. The Danish Government has taken a decided step in the direction of the speedy development of aerial navigation between Denmark and the neighbouring countries, by acquiring a considerable number of "Bristol" biplanes on behalf of the nation, and they are now on their way to Denmark. Accompanying them are a number of skilled British airmen, who are to act as instructors of the Danish pilots to be employed on the projected services.

MESSRS. CELLON, LTD., are branching out in several directions, and notably in Spain, where they have opened a branch establishment. The address is Baraquillo 17, Madrid, where they are represented by Mr. T. F. Cowan. They have already received orders from the Spanish Government for their scheme "A," scheme "B" and "red Δ" scheme.

ON Monday of last week a fire of no small dimensions broke out in the spraying room of Aero Coverings, Ltd., at their works in Willesden Lane. Mr. D. Hutchinson, the managing-director, was hastily summoned, and realising the gravity of the position in a moment, directed the firemen to turn their chief efforts to the store of doping material. Great credit is due to the excellent behaviour and prompt action of the members of the staff. The ground floor and a large portion of the stock were badly damaged by the water, although a considerable number of aeroplane wings were moved out of harm's way. The works were, thanks to the energies of all, practically working at normal speed within three or four days.

MESSRS. JOHN BIRCH AND CO., LTD., export engineers, of London, announce that they have undertaken the Overseas agency of William Beardmore and Co., Ltd., the well-known Glasgow engineering firm, who have during the War produced a large number of airships, aeroplanes, and aero engines, among many other "munitions." The Beardmore workshops are rapidly being converted from War to peace production of metals and machinery for distribution throughout the world. The Birch organisation, already far-reaching, is being further extended to meet these new requirements.

Aeronautical Specifications Published

Abbreviations:—cyl.=cylinder; I.C.=internal combustion; m.=motors.

APPLIED FOR IN 1917

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published July 17, 1919

10,969. W. H. WOOD. Propellers, etc. (128,310.)
11,008. BLACKBURN AEROPLANE AND MOTOR CO., H. BOOTH and J. W. COPLEY. Pulleys and other flexible connections for aircraft. (128,313.)
11,009. BLACKBURN AEROPLANE AND MOTOR CO. and H. BOOTH. Folding wings of aircraft. (128,314.)
11,096. F. SAGE AND CO. and N. A. T. N. FEARY. Fairings for struts. (128,319.)
12,849. E. E. BROWN and D. J. MOONEY. Metal construction for aircraft. (128,322.)

Published July 24, 1919

157. A. BROCK. Aerial photography. (128,593.)
11,147. BLACKBURN AEROPLANE AND MOTOR CO. and H. BOOTH. Lifting attachments for aircraft. (128,599.)
11,172. W. E. BACK. Control of flying-machines. (128,602.)
11,175. A. H. GLEDHILL. Apparatus for releasing bodies from aircraft. (128,603.)
11,182. A. TOMPKIN. Safety tank for inflammable liquids. (128,604.)
11,215. BLACKBURN AEROPLANE AND MOTOR CO. and H. BOOTH. Boats or floats. (128,605.)
11,265. A. BROCK. Aerial photography. (128,609.)
11,328. BLACKBURN AEROPLANE AND MOTOR CO. and H. BOOTH. Hydro aeroplane hulls or floats. (128,611.)

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3,639. G. H. THOMAS and S. W. HISCOCKS. Laminated spar. (128,329.)
8,064. A. A. HOLLE. Control of aeroplanes. (128,341.)
8,195. W. TAYLOR. Gyroscopic level indicator. (128,345.)
9,326. S. E. GRAND. Parachute device. (128,352.)
9,858. E. KITCHEN. Stabilising and speed-increasing devices. (128,367.)
10,905. PARNALL AND SONS and H. BOLAS. Cowling of rotary engines. (128,421.)
10,926 and 10,927. G. H. THOMAS and F. J. TIPPEN. Airships. (128,422 and 128,423.)
11,363. BLACKBURN AEROPLANE AND MOTOR CO., H. BOOTH and G. E. PETTY. Flying boats. (128,430.)
16,109. G. CLOWES. Portable steps for use in rigging aeroplanes. (128,481.)
17,059. W. S. CLAYTON. Incline indicators. (128,488.)
19,418. R. A. SILK. Platforms for use when adjusting compasses of aircraft. (128,495.)

Published July 24, 1919

7,812 and 7,817. F. SAGE and Co. and N. A. T. N. FEARY. Fabrics for aircraft. (128,690 and 128,691.)
10,415. L. R. ACCORNERO and A. GAYDON. Aeroplanes. (128,724.)
10,872. R. M. BEATTIE. Parachutes. (128,753.)
10,875. A. RAMAUGE. Parachutes. (128,754.)

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9,495. A. BOERNER. I.C. engines for airships. (128,888.)

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